



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

University of Wisconsin
Library

CLASS

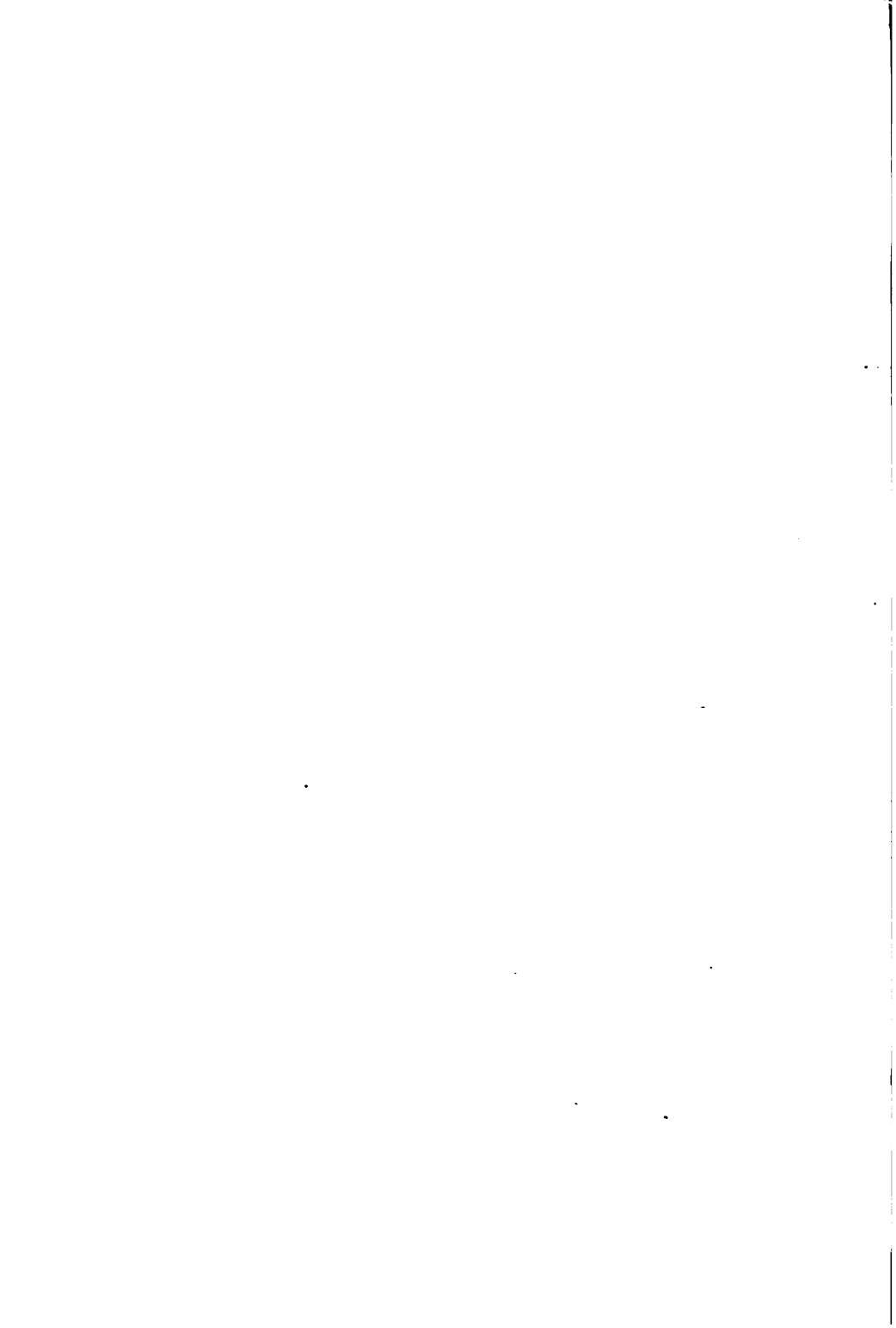
BE

BOOK

R44



THE ENGLISH AND FOREIGN
PHILOSOPHICAL LIBRARY



*THE PRINCIPLES OF THE CRITICAL
PHILOSOPHY.*

INTRODUCTION TO
THE THEORY OF SCIENCE
AND METAPHYSICS.

BY

DR. A. RIEHL,

PROFESSOR OF PHILOSOPHY IN THE UNIVERSITY OF FREIBURG I. B.

TRANSLATED BY

DR. ARTHUR FAIRBANKS,

LECTURER ON THE PHILOSOPHY OF RELIGION IN THE DIVINITY SCHOOL
OF YALE UNIVERSITY.

LONDON:

KEGAN PAUL, TRENCH, TRÜBNER, & CO. LTD

PATERNOSTER HOUSE, CHANCERY CROSS ROAD.

1894.

The rights of translation and of reproduction are reserved.

60261

OCT 16 1901

BE

.R44

TRANSLATOR'S PREFACE

PROFESSOR RIEHL'S book on Philosophical Criticism has made a deep impression on philosophical thinkers in Germany; a second edition of the original work is already called for, and parts of it have been republished in a Russian translation. Even after the careful and thorough review of the book by Professor Adamson, in *Mind*, January 1889, I find that it is not generally known to English and American readers, so that I believe its usefulness will be materially increased by a translation into English. The original work consisted of three parts. The first, entitled "History and Method of Philosophical Criticism," gives a history of the critical method as used in turn by Locke, Hume, and Kant. The second part discusses the sense basis of experience, sensation, space and time, and perception, and also the logical principles of scientific experience: namely, the principle of identity, causality, and the categories of substance and force. The third part, of which the present work is a translation, discusses the problems of the general theory of science, and problems of metaphysics, from the standpoint of the critical philosophy.

It is idle to expect that any discussion of such problems will command complete assent from the reader, any more than from the translator, but the treatment in the present volume seems to me to shed much light on some problems that are widely discussed to-day, and to open certain problems anew which we have too hastily settled. The critique of metaphysics differs from those more familiar to English readers, in that it is largely

devoted to that most widespread metaphysics of our own day which calls itself by the name of science, and brings forward its dogmas under the shelter of columns of figures and records of observations. The conception of scientific experience is profoundly modified by Professor Riehl's theory of the immediate perception of the external world; and the question as to the relation of psychical phenomena and physical processes receives a clear answer in harmony with the positions of the Kantian philosophy. Finally, I should like to call attention to the distinct recognition of the social factors in experience, *e.g.*, in Part I., chapter iii.; Part II., chapters i. and iii. The principles of logic and of ethics have a social existence and sphere of activity, which has been obscured by the tendency among philosophers to regard each mind as an independent unit or monad. Individual personality is a social product, and the attempt to explain thought and action without reference to society is essentially absurd.

With reference to the translation itself only a word is necessary. I have ordinarily translated the word *Vorstellung* by *idea*, although not infrequently some other word was necessary to bring out the sense clearly; I have written *Idea* when the German word was *Idee*, except in some cases where it seemed fair to translate this word by *ideal*. It goes without saying that I have not attempted to reproduce the German literally, but I hope the meaning has been rendered with accuracy. Much of the translation has been read by Professor Riehl, and parts of it by other friends; the author has made numerous minor changes and corrections which will be incorporated in the second German edition.

ARTHUR FAIRBANKS.

NEW HAVEN, CONNECTICUT, U.S.A.,
April 1894.

AUTHOR'S PREFACE TO THE ENGLISH TRANSLATION

THE German original of this work, appearing in 1887, formed the conclusion of a larger work, "Philosophical Criticism, and its Meaning for Positive Science." Still, the following investigations as to the general theory of science, and metaphysics, have a considerable degree of independence, both as to the subjects treated, and the form of treatment.

The first division of the book discusses problems of the general theory of science: questions as to the true idea of philosophy, and the distinction between metaphysical and scientific system-making, as to the limits of knowledge which are found to be its presuppositions, and as to the origin and conception of experience. The second part treats those metaphysical problems which the critical method can grasp and handle scientifically. The author includes under this heading the questions as to the reality of the external world, the connection of psychical phenomena with material processes, the problem of the freedom of the will, the cosmological problem of the infinite, in so far as this stands in connection with the principle of the indestructibility of matter, the persistence of force, and the fundamental idea of causality, and finally the discussion of the relation of necessity and adaptation in nature, of the mechanical and the teleological conception of things.

The separation of the book into two parts should not destroy the inner connection of the thoughts. Although

this arrangement of the material may have necessitated some repetition, still it had the advantage of giving greater freedom to the discussion than would have been possible if the topics had been arranged according to an exact system. The reader will recognise that chapters i. and iv. of the first part stand in close connection, as also chapter ii. of the first part, and chapters ii. and v. of the second part.

In treating the question of the determinism of the will and practical freedom, it proved impossible to avoid some questions of practical philosophy. In antithesis to ordinarily received opinion, it was necessary to show that determinism alone explains moral responsibility and justifies it. With reference to the history of the idea of responsibility (p. 246), it may be added that in primitive states of society, it is not the doer at all, but rather his clan, which is held responsible for an act.

May the book in this form also contribute something to the understanding of these scientific problems, as well as to the distinctly practical task of philosophy.

A. RIEHL.

FREIBURG I. B., *April* 1894.

CONTENTS

PART I.

PROBLEMS OF THE GENERAL THEORY OF SCIENCE.

CHAPTER I.

THE PROBLEM OF PHILOSOPHY.

- § 1. The twofold conception of philosophy in antiquity—Philosophy as the science of the Greeks. § 2. The Greek form of science supplanted by the modern form in the seventeenth century—Idea of philosophy held by Galileo, Hobbes, Descartes, and Leibnitz—Separation of philosophy and science in the period after Kant. § 3. Theoretical philosophy is not a systematic theory of the world—The scientific elements of the theory of the world are furnished by positive investigation. § 4. Philosophy as science and as critique of knowledge. § 5. Relation to logic; distinction from the study of the development of consciousness. § 6. The practical conception of philosophy. § 7. The root of the practical and of the theoretical view of things. Philosophy as theory and as ideal of action . . . 3-23

CHAPTER II.

THE LIMITS AND PRESUPPOSITIONS OF KNOWLEDGE.

- § 1. Meaning of the problem—Limits of observation and degree of the exactness of knowledge. § 2. Self-limitation of scientific knowledge—Opposite methods of dealing with inner and outer phenomena—Limits between natural science and psycho-

logy. § 3. Criticism of the proposition that we do not know the essence of things—Relativity of the concept essence—The “essence” of things is made by the mind, and so must be completely knowable. § 4. The distinction between things themselves and phenomena cannot be understood as a difference of value—Thing-in-itself and noumenon. § 5. The facts of experience are psycho-physical phenomena—The correlation of subject and object. § 6. The question: How do sensations arise from motions of atoms? is falsely stated; its true statement is at the same time its solution. § 7. Physical laws as laws of sensations—Real and possible phenomena for external sense. § 8. Motion is not the cause of the character of a sensation—Relativity of the ideas of extension, impenetrability, and motion—The scientific idea of the external world. § 9. The theory of descent and development cannot explain the qualities in sensation—Meaning of sensation for the theory of knowledge. § 10. Sensation and consciousness—Impossibility of explaining consciousness—Law in the external world, and the unity of consciousness—Relation of the unity of consciousness to the principle of the persistence of matter and force	24-47
--	-------

CHAPTER, III.

THE ORIGIN AND CONCEPT OF EXPERIENCE.

§ 1. Empiricism and nativism—Mechanical origin of the activity of sense—Physiological nativism may take the place of psychological. § 2. Empiricism and nativism in philosophy. § 3. The theory of unconscious inferences: Schopenhauer and Helmholtz—Projection of sensations—Retina images not real but virtual images—Vision without retina images—Distinction between real and perceived space—Projection into “real” space a conscious act. § 4. The perception of the external world immediate and original. § 5. Perception and experience. § 6. Origin of the universal validity of perception—Experience as a social conception—Psychological and logical categories. § 7. Cause and reason, thing and substance as examples. § 8. The <i>a priori</i> element in experience. § 9. Reduction of the logical categories to the analytical, synthetical, and analytical-synthetical unifying function of consciousness. § 10. Summary and explanation	48-72
--	-------

CHAPTER IV.

DARWINISM AND TRANSCENDENTAL PHILOSOPHY.

	PAGE
§ 1. Explanation of mental development by the laws of biological development—Psychical life of man and of animals. § 2. Meaning and problem of transcendental philosophy— <i>A priori</i> does not mean innate—The question as to the origin and development of the forms of thought has only subordinate meaning for transcendental philosophy. § 3. Logical and mathematical categories could not have arisen by adaptation and natural selection. § 4. The category of causality is not innate—Distinction between the completion of a perception, and the giving of a reason for a change—Unscientific and scientific induction	73-84

CHAPTER V.

METAPHYSICAL AND SCIENTIFIC SYSTEMS.

§ 1. The double interest of the mind—Alternating periods in the history of science—Our scientific age—A relative metaphysics—Scientific and metaphysical hypotheses. § 2. Kant's critique of metaphysics—The method of this critique—Ideas of the pure reason are not a peculiar class of concepts—The assertion of a transcendental illusion, and the sophistries of the pure reason. § 3. Classification of metaphysical systems as a means of criticising them. § 4. Science and metaphysics—The demands of verifying proof. § 5. Disparity of promises and results in metaphysical philosophy—Spinoza and Hegel—The "inability" of nature—What Hegel means by an empirical proof—The method of analogies—A classical example. § 6. Metaphysics presents an older type of thought—Uncritical and critical effort for the unification of knowledge. § 7. Metaphysical and scientific generalisation. § 8. Spencer's formula of development as an example of the former. § 9. Abstraction and generalisation, subsumption and deduction—Induction and generalisation—The three principal cases of deductive inference—Conclusion: Application to science—The philosophical problem of the present day	85-119
--	--------

PART II.

PROBLEMS OF METAPHYSICS.

CHAPTER I.

REALITY OF THE EXTERNAL WORLD AND
IDEALISTIC THEORIES.

- | | |
|---|---------|
| | PAGE |
| § 1. Realism the basis of logic—The idealistic hypothesis and the dream. § 2. Idealism in antiquity—Proofs from Plato and Aristotle—Rationalistic and empirical idealism—Idealistic theories in modern philosophy—Motives to idealism—Berkeley's denial of matter—Fichte's ethical idealism—Schopenhauer's pessimism as the root of his idealism. § 3. The two great classes of idealistic arguments—Refutation of these. § 4. True meaning of <i>Cogito ergo sum</i> . § 5. The correlativity of subject and object, and idealistic positivism. § 6. Perceptions are not mere ideas, but phenomena—The real in consciousness. § 7. The individual consciousness and the existence of the external world—Hume's critique. § 8. The consequences of idealism and the facts of consciousness. § 9. Dependence and intermittence of consciousness—Transcendental-logical and psychological consciousness. § 10. Berkeley's theory of spirits—The existence of our fellowmen not reached by inference—Clifford's conception of effective knowledge—Monadological idealism of Leibnitz—The social proof of the reality of the external world. § 11. Critical realism. Résumé . | 123-166 |

CHAPTER II.

ON THE RELATION OF PSYCHIC PHENOMENA
TO MATERIAL PROCESSES.

- § 1. The physiological antinomy. § 2. Apparent impossibility of solving it—The presupposition of the antinomy. § 3. The dogmatism of natural science. § 4. Refutation of it by the Paralogisms in the "Critique of Pure Reason"—Kant and Du Bois Reymond—Kant overcame transcendental dualism, but left open the escape to transcendent. § 5. Dualism the consequence of dogmatic materialism—Definitions of matter and

spirit. § 6. Dualism as system and as method; quantitative and qualitative investigation of nature—The existence of qualitative reality in nature. § 7. Mechanism as a form of knowledge—Self-activity of the elements. § 8. Identity of the physical and the psychical—Limitations of this view and difference from the hypothesis of correspondence. § 9. Relation of physiological processes to the psychical functions of the nervous system—The error of materialism. § 10. Influence of the will on movement. § 11. Biological meaning of consciousness—Schopenhauer's view. § 12. Critical monism, doctrine of unity, and pan-psychism. § 13. How to think a twofold phenomenal appearance of one and the same thing. § 14. Psychology as an aid to physiology—Physical side to nervous processes—Hering's chemical hypothesis—Repetition. § 15. Exact meaning of the parallelism of psychical and physical phenomena—The objective criterion of the existence of psychical functions. § 16. Psychical association as anomaly—Its meaning for the theory of knowledge . . .	167-205
--	---------

CHAPTER III.

DETERMINISM OF THE WILL AND PRACTICAL FREEDOM.

- § 1. Determinism and the heliocentric theory—Morals and determinism. § 2. Explanation of the appearance of freedom by Spinoza and by Schopenhauer—Causes and motives of willing. § 3. Why the causes of the will do not come into self-consciousness—Impulsive acts and acts of will. § 4. Action not appearing free to self-consciousness—Absence of inner compulsion no argument for the freedom of the will—Hume. § 5. Objective consideration of acts of will—The heliocentric standpoint. § 6. Empirical proof of determinism—Connection between reflex, instinct, and will. § 7. Freedom of the will is inconceivable—Kant and Schopenhauer—*Operari sequitur esse*—Confusion of metaphysical freedom with freedom of the will—Delboeuf's attempt to make the freedom of the will conceivable—Contradiction between freedom of the will and identity as a law of thought. § 8. Apparent freedom of indifference for indifferent actions—Moral actions not indifferent actions—Irrationality of freedom of the will—Determinism does not make action of no effect—The order of nature and the human will parts of one and the same thing

—False fatalistic consequences—Fatalism, indeterminism, and determinism. § 9. The basis of fatalism: the hypothesis of the laws of nature—The concept of natural law. § 10. Indeterminism gives up the inner life to chance. § 11. Responsibility—Freedom of the will is not consistent with responsibility—A being which knows itself responsible is responsible—Social psychology—Origin of responsibility—The will of the community—Responsibility is a cause, not the result of our moral nature—The subject of responsibility. § 12. Determinism and practical freedom—Concept of practical freedom—The double will of man—Control of the will by controlling the causes of the will—Practical and transcendental freedom. § 13. Influence of social life on the individual—Origin of duty—Formal and material morality. § 14. Concerning the theory of the development of the will—Education of the will. § 15. Helvetius and Schopenhauer on the formation of character—Proof of the changeability of individual character—The natural constitution of man from the standpoint of the theory of development—Limits to the change of character—An idea of Plato's—The composition of character. § 16. Contradictions in Kant's theory of freedom—The relativity of practical freedom. § 17. The theory of the intelligible character—The moral race-character of man—Solidarity of the individual's life with the life of the community .	206-267
---	---------

CHAPTER IV.

THE COSMOLOGICAL PROBLEM OF THE INFINITE.

- § 1. The concepts, world and nature—The cosmological and the physiological problem—The cosmological antinomies of Kant—Examination of the proof of the first antinomy. § 2. Critique of the decision of the cosmological question by Kant—Impossibility alike of an empirical and of an *a priori* decision of the problem. § 4. Dühring's distinction between the indefinitely great and the unlimited. § 5. Finiteness of the mass of matter—Contradiction between the assumption that matter is infinite and the principle of the constant quantity of matter and force—The extent of the sense world in space is dependent on the law of the division of matter—No limit to possible hypotheses. § 6. The existence of the world in time, and the principle that

change is subject to cause—Refutation of the assumption of a changeless original state of the world. § 7. Relativity of the ideas of beginning and end—The world as a whole does not stand under determinations of time—The world as basis of external phenomena is not itself a phenomenon in space—Reversal of the ordinary mode of thought with reference to the idea of space—Concepts of the unchangeable—The concept of quantity not applicable to the whole of things—No repetition of the same series of phenomena	268-303
--	---------

CHAPTER V.

NECESSITY AND ADAPTATION.

- § 1. Anthropomorphism and the critical philosophy. § 2. Relation of the concepts : necessity and adaptation—The objective factor in the concept of necessity—Laws in nature the product of the mind—Mechanical reasons for change. § 3. Direct and inverse causal inferences—Analogy between the conversion of the logical proposition of reason and conclusion, and the mechanical causal judgment—Distinction between the inverse causal judgment and the teleological—Mechanisms in nature and artificial machines. § 4. Organic processes are not explained by showing their purpose—Nor is the origin of an organ and the existence of its function to be apprehended teleologically—Kant's critique of the teleological judgment—The theory of selection. § 5. Reasons for the procedure of the biological sciences—The concepts : end and means, not to be separated from the relation to conscious purpose—"Effort to attain a goal" and definiteness of direction—The concept of end cannot be applied to the world as a whole—Every conscious being regards its own existence as a final end—Relativity of all ends—The concept of end is subordinate to the concept of causality—Banishment of ends from natural science—Socrates, Aristotle, and Kant—There is only one limit to the investigation of the external world. § 6. Adaptation for the mind—The antinomy of the teleological judgment—Empirical regularity of phenomena the source of the empirical understanding. § 7. The final end and the principle of development in the moral world—Teleological causality—The psychological concept of impulse—Anticipation of experience—Control of the future by means of the past. § 8. Man the being in nature who proposes ends of action—Spontaneity in things and the *a priori* in con-

sciousness—Influence of purposeful actions on the individual organisation — Functional adaptation — The possibility of a phylogenetic meaning of the purposeful activities—The influence of a psychical function on the physical organisation presupposes the identity of the substratum of the physical and the psychical—Single principle of the knowledge of nature.	
§ 9. The end in practical life—Critique of Spinoza—Practical and theoretical view of things—Purpose in history—Dualism of nature, and of the sciences of mind. § 10. Necessity, uniformity, and adaptation as directive ideas for grasping things as a whole—These ideas interwoven in the religious and metaphysical view of the world—Character of the scientific view of the world—Mental life as the product of development in nature	304-346

PART I.

*PROBLEMS OF THE GENERAL THEORY
OF SCIENCE.*

16

INTRODUCTION

TO THE

THEORY OF SCIENCE AND METAPHYSICS

CHAPTER I.

THE PROBLEM OF PHILOSOPHY.

§ 1. SINCE Locke's Essay on the Human Understanding, philosophy has been in a critical period, which must issue either in its overthrow or its transformation. This crisis of philosophy may be called philosophical criticism, or more effectively the critique of philosophy. It is true that this critique, successive stages of which were represented by Locke, Hume, and Kant, immediately affected only metaphysics. But the influence of this metaphysical mode of thought had so permeated all parts of philosophy, that whatever affected metaphysics, touched the central point of philosophy itself. Metaphysics alone had reserved to itself over against the positive sciences a peculiar province, not accessible to the methods of these sciences, the province of supersensual objects; while all remaining parts of philosophy (except one) had either been absorbed by positive science, or had had their doom pronounced. When the scientific character of metaphysics was attacked, philosophy itself became problematical, its right to continue as a science became an open question.

In antiquity philosophy served a double purpose. It took the place of modern science, and in addition it was

the theory and the habit of practical wisdom. These two fields express the twofold goal of all mental culture—the investigation of truth and the realisation of human ends. Inasmuch as the two proceed from different and even opposite attitudes of man to things, they ought never to be confused as they sometimes were in antiquity, especially by Plato. Instead of seeking a single definition to cover the essence of philosophy, it is important to notice that two non-homogeneous concepts are connected under this name.

To the question, Which science is philosophy? the answer of antiquity was clear and simple, *The science*. Apart from mathematics there was in antiquity no science alongside of philosophy, and Plato regarded mathematics only as the propædæutic of dialectics or philosophy, and as subordinate to this. Aristotle, whose clear-sighted mind was specially adapted for distinction and classification, and who began to separate the different sciences, preferred to use the word philosophy in the plural, making it synonymous with our word science. He does indeed distinguish between the other sciences or philosophies and a first philosophy as the most general science. But he makes this distinction depend on the existence of a particular transcendent object of investigation. If, he says, there is an unmoved being, immaterial and separate from things of sense, then the science of this is the first philosophy, but if there is no such substance then physics is the first and most general science. There can be no doubt as to our attitude to-day toward this alternative. For whether such an object exists or not it certainly cannot be the object of a scientific investigation.

Philosophy is the science of the Greeks, it is the science of the Greek period, while the new sciences considered as a whole form the philosophy of modern peoples and times. The old and the new science differ in method alone, not in their objects or their goal.

To-day we seek the same objects as were formerly sought by philosophical systems; namely, the knowledge of nature and of man, the clear understanding of the motions of the heavenly bodies and of the processes of life, the consideration of moral relations and the discovery of the laws of social institutions; but our method is that of positive research. The experimental natural science of to-day has taken the place of the speculative natural philosophy of former times. Psychological analysis and the explanation of mental phenomena in the individual and in the community on the basis of their development, continue the work of the older psychology, ethics and politics.

The Greeks were limited in their scientific investigations to the intuitions of sense and a purely logical treatment of conceptions. They were not familiar with exact, carefully planned observation nor with experiment based on measurement, but were the rather contented to compare phenomena with the ideas which they had previously formed of them. For them to philosophise meant, on the basis of a few inexact experiences to establish the essence of things by mere meditation on conceptions. And when such speculation happened to reach theories which really were in accordance with the facts and which might be verified by experience, they never thought of developing these theories any farther. It is not true that in their science they used pre-eminently the method of deduction. They did not know the real deductive process, which by connecting general laws reaches a definite single phenomenon, they only knew how to arrange conceptions already formed, according to genus and species. This fault of method in antiquity no one can dispute. And when it is ascribed to unfamiliarity with the instruments of scientific investigation, the importance of these external aids, compared with the inner powers of the mind, is greatly exaggerated. The advance in man's knowledge of nature is not primarily

due to the technique and the instrumental equipment of the investigation. In order to be able to invent instruments, the mind must be already in possession of the true method. The instruments of investigation are the product of the method, the visible or material expression of the psychical process itself. With a few exceptions, students in antiquity never thought of creating instruments to put their method in practice externally, because the true method of explaining natural phenomena was unknown to them, and consequently must remain foreign to their whole mode of thought. In spite of their great artistic and rhetorical endowment, the sense for facts was lacking. And of what use could be the mere accumulation of facts, *e.g.*, for the discovery of the law of free fall? Modern science began with the explanation of this relatively simple, fundamental phenomenon, which presses itself on daily observation. The genius of a Galileo would not have been necessary to discover the laws of fall and so to lay the foundation for physics, if observation and formal logic, the only methods applied in antiquity, had been sufficient for this. It is only the correct treatment of phenomena by thought which leads to the discovery of the proper means to prove the theoretical assumptions by experiment. And how simple was the experimental apparatus which was sufficient for Galileo to prove the laws of fall!

The Greeks formed a theory of the world before they had studied a single process in the world accurately and in detail. Their philosophy is the immediate continuation of the cosmogony of their poets; the philosophical myth about the world followed the poetic. This first course of development of scientific knowledge, which begins with the Greeks, is certainly natural. Its historical meaning ought never to be contested or undervalued. The long delay in this first stadium of knowledge must, however, be explained by the peculiar character of the Greek mind. Even Aristotle was not able to rise above

the general standpoint of Greek science; the very principles of his metaphysics were formed in imitation of the creative art of man. The Greeks were especially interested to outline an all-embracing system of the universe, which by its unity and completeness, should not fail to make an æsthetic impression. So incomplete was their knowledge that they only succeeded in forcing the world and nature into a human form of apprehension. Modern sciences, on the other hand, regard the system as the final goal of their common investigations, which can be approached only gradually and through the knowledge of details. Instead of explaining nature from the being of man, they follow the reverse process and seek to understand human life from the general laws of nature.

§ 2. The Greek form of science was supplanted by the modern form in the seventeenth century. This state of the case was fully recognised at the time. Instead of thinking of philosophy and science as antitheses, those who introduced the new method were convinced that they were continuing the work of philosophy in the only correct way. They continued to regard natural science as natural philosophy, without at all recognising that the latter ought to be or might be something very different, and even higher than the former. So when Galileo says that he has occupied himself more years with philosophy than months with mathematics, there is no doubt that he meant simply natural science; and even Newton himself called his principles of mechanics, principles of natural philosophy. We find a similar belief that philosophy and science mean the same thing, even in those thinkers of the period whom we are wont to regard as pre-eminently philosophers, such as Hobbes, Descartes, and Leibnitz. The latter in the same spirit included Kepler and Galileo among the founders of modern philosophy.

Hobbes defined the problem of philosophy as the deduction of effects from causes previously known, and

the discovery of probable causes on the basis of given effects. The first part of this definition relates to the knowledge which has its origin in ourselves—mathematics and the general theory of motion, while the second relates to empirical natural science; so that for Hobbes philosophy coincides with mathematics and natural science. In his explanation of natural processes Hobbes stopped with relative causes, the causes which are related to the phenomena and may be confirmed by phenomena, a fact which shows clearly the severely scientific character of his mind. His deeply grounded scorn of metaphysics is equally remarkable. He did not think it worth while to "lay this ghost," as he says, but will leave it to time to banish it from science. Instead of following Plato and Aristotle, who would have choked beginning science with nooses woven of words, he attaches himself to the heroes of modern philosophy, in particular Galileo, with whom as he says the age of physics commences, and Harvey, the founder of experimental physiology. And the spirit of mathematical science he adopts as his own. He noticed the analogy between logical operations and mathematical calculations. His elements of philosophy include a comprehensive outline of science, in which he defends a very natural and reasonable view, especially of psychical phenomena. He claims the credit of having established the science of the state. This science, he says, is no older than the book he has written about the citizen. As Harvey investigated the processes of man's natural body, so Hobbes in a scientific spirit aimed to investigate the functions of that artificial body which is called the state and is constituted by ourselves. And in fact Hobbes did become the father of our modern science of society and of ethics, by thus applying the principles of positive science to politics and morals.

Under the title, *Philosophical Essays*, Descartes—who was younger than Hobbes, but whose works were

written earlier—published together with his Treatise on Method, the Dioptrics, the Discussion of Meteors and the Geometry. The fact that so various subjects, in part mathematical, in part scientific, were treated under the same title show that Descartes recognised no distinction between philosophy and science. For him the positive sciences are so many parts of philosophy, or as he puts it, of human wisdom. The French thinker is at the same time and pre-eminently, a mathematical student of nature, as a glance at his works will show. He had formed correct ideas of the method to be followed in the explanation of natural phenomena. Phenomena, he says, are to be explained by principles; principles, to be proved by phenomena. And without doubt his own investigations would have borne greater fruit if certain habits of mind due to his scholastic education had not proved a hindrance. It was more than anything else the belief that he could deduce everything from a pair of conceptions which he regarded as clear and distinct, that prevented him from understanding the scientific discoveries of Galileo. It would be incorrect to regard him as a mere metaphysician on this account; for both by word and example, Descartes recognised the necessity of observation and of experiment. I am not afraid of awakening opposition among scientific readers if I agree with Descartes's own statement that his greatest achievement was not his proof of God's existence, or of the real difference between soul and body, but rather his grandly conceived attempt to explain mechanically the totality of external phenomena, from the origin of the heavenly bodies to the processes of life and the material conditions of sensation. Descartes even more decidedly than Bacon, banished the consideration of final causes from the field of natural science. In his book entitled *The World*, or a Treatise on Light, he attempted to show how an orderly nature must arise out of an original chaos as the result of the general properties

of matter and laws of motion. Accordingly he regarded the cosmos as the result of a mechanical development. He even approached the theory of the persistence of energy in his proposition that the sum of motion in the whole of nature remains always the same. Every process in nature is conceivable only as motion. Even life, he is convinced, forms no exception. Accordingly he describes the processes in the organism mechanically, instead of explaining them by a mere word as the result of a "life-force." In this he is one of the forerunners of the modern physico-chemical physiology. His hypothesis that animals have no sensation is undoubtedly false as a statement of fact. Regarded as an abstraction for the purpose of explaining animal movement on purely mechanical principles, it put Descartes in position to discover reflex motion and to recognise its extent and importance.

It is superfluous to prove that Leibnitz also made no separation between science and philosophy. It is well known that this many-sided thinker has a far more important place in the history of mathematics and the exact sciences, than in the history of metaphysical philosophy. Certainly it requires a strong prejudice in favour of the latter questionable discipline, if one is to place his monad-making art or even his theodicy above those severely scientific achievements—his introduction of the algorithms of differential calculus, his share in the advance of dynamics, his additions to the empirical sciences, as for example geology. But even where Leibnitz used the philosophic methods of antiquity and of the scholastics, he attempted to imitate the procedure of the actual sciences. He expresses himself with great emphasis against the system-making, sect-making spirit in metaphysics, and desires to reach the truth by comparing different systems and mediating between them. The very example of Leibnitz has shown that this course is impossible; metaphysics

must be expressed in personal systems, and this is sufficient proof of its unscientific character.

The examples of the thinkers and investigators to whom we owe the creation and the early development of modern science, show that in their opinion philosophy and science ought to mean the same thing, that they recognised no philosophy alongside or outside of science. They regarded science as the new philosophy which had taken the place of the old Aristotelian, scholastic philosophy.

We agree with this view on the whole, and find ourselves obliged to regard the belief in the possibility of another, perhaps a higher mode of knowledge than the strictly scientific, as an illusion which owes its power over the mind to the old habit of speculating about things, *i.e.*, of studying them in the light of a preconceived idea, instead of investigating the things themselves. As there can be no twofold truth about one and the same thing, so there can be no two sciences covering one and the same field. If we think of the work of science as completed or nearly completed in any one field, where does there remain the least room for philosophical speculation? There can be no particular natural philosophy alongside of natural science, nor can the study of the basis and the methods of the investigation of nature which form a part of the general theory of science, be called natural philosophy. "Pure natural science" cannot be separated from applied science as an independent philosophical discipline, for matter cannot be constructed *a priori* as a mere concept of quantity. The philosophy of nature means nothing more or less than the mathematical and experimental investigation of nature. To explain mental phenomena means to analyse them, to trace the history of their development, and to follow out the influence of the social medium on the mental life of the individual. It is erroneous to believe that we can ever know more of the so-called essence of matter than

is taught and will be taught by the physical and chemical investigation of matter; or that knowledge of the mental and psychical processes can be reached in any other way than by the methods of psychological analysis, physiology, and history. The positive science of nature and spirit is at the same time the philosophy of nature and spirit.

There is no difficulty in seeing why the old form of science should still persist although it has really been supplanted by the new method of investigation; for all forms of life which belong to the past tend to persist a long time beside those more recently developed, until they have been completely absorbed by the latter. So the philosophy of antiquity, together with its offspring the scholastic philosophy of the Middle Ages, has been intermixed with modern science in various and often remarkable ways, and has given rise to the "systematic philosophy" of modern times.

The separation of philosophy and science which has culminated in regarding them as antitheses, dates back no further than the period which in Germany followed Kant. Then for the first time the opinion arose that philosophy could be prosecuted without science and even in open contradiction with science. This antithesis of philosophy and science forms an isolated episode in the history of thought, which to-day appears to be more than a passing phenomenon only because it is so near us in time, and which is to be explained from special causes, namely the temporary excess of æsthetic culture over scientific among the German people. As in Italy the century of natural philosophy followed the fifteenth, the century of art, and preceded the century of natural science, so in Germany the period of philosophical speculation followed the period of classical poetry and was immediately connected with romantic poetry; and systems were created in a rapid succession which is only paralleled in the period of Greek

science and in the sixteenth century period which preceded the creation of modern science. There may be different opinions in regard to the general importance of these systems in the history of culture, the influence which they exerted on the art and literature of the time and which this art and literature exerted on them, and in regard to the ideas born of phantasy which in rare cases may have benefited later science. This cannot affect the opinion as to its scientific value or rather absence of value. To-day we regard it as a retrogression to the forms of thought of a period which has not yet drawn a sharp line between poetry and science.

Only works of poetry are created out of the unity of an idea and developed by a single individual. The results of science are rather the product of the common, continuous labour of many. So long as modern science imitates the example of early Greek thinkers and attempts a closed, unchangeable system of knowledge (and has produced such systems, if one will take the will for the deed), so long it proceeds rather in the spirit of artistic creation than of scientific investigation, and Schopenhauer has only betrayed its secret when he calls this sort of philosophy an art that deals with concepts. My only question is whether concepts are the proper material for artistic production. In the speculation of the metaphysicians the limits between science and poetry are constantly transgressed, half-poetic works are clothed in the form of a scientific treatise. Here the model has been set by antiquity. The Greeks, whose artistic faculties and interests by far exceeded their scientific, regarded the world as the beautiful, symmetrical whole of things, giving special weight to the æsthetic impression of the whole; and they sought to imitate this whole by a peculiar kind of art, an architectonic of conceptions. That which was natural in the youth of science and in accordance with the

special endowment of the Greeks, has to-day become simply imitation, and is to be regarded as an anachronism.

There is no antithesis between science and philosophy. Such an antithesis can only exist between the old, out-lived form of science and the new form full of life which it assumed in the seventeenth century. Philosophy in the larger sense of the word coincides with science as such; in its narrower meaning it forms a particular definite science parallel to the other sciences.

§ 3. The particular task of philosophy has been to establish a general theory of the world. Philosophy aims to be such a general theory, its method consists in the generalisation of the generalisations of science. But can science avoid advancing to the highest results of its generalisations? Undoubtedly the establishment and development of the scientific theory of the world is the common goal of the sciences as a whole. Just because it is the goal of science as a whole, it cannot be the task of a particular individual discipline.

By simply uniting the results of scientific investigation, either an encyclopædic system is reached which must change its form with every considerable advance of positive science, or else one gets an abstract, purely schematic formula like Spencer's formula of development, which becomes so much the more empty and indefinite the better it fulfils its purpose of expressing the analogies in every field of investigation. The system of sciences is not developed out of any such abstraction, nor by cancelling any of the general results of investigation; it grows gradually with the advance of knowledge, and the security of this growth is greater, the less it is disturbed, the less a system is expressly sought or presupposed.

Finally, the concept "theory of the world" needs the criticism which separates its scientific parts from the unscientific. As the term is used by metaphysical philosophy, it is nothing more than a universal anthropo-

morphism. The spirit with its desires has taken larger part than the understanding with its scientific insight, in the formation of the image of the world as this is represented in the philosophical systems. One need only think of the strife between pessimistic and optimistic views of the world, in order to see in what degree the wishes of man enter into the formation and direction of his views. No one familiar with what is to be demanded of a scientific proof, will expect that such a subjective philosophy depending on temperament and mood, can be an object of real proof or disproof. The reaction of the human spirit to the total impression of things has of course its objective occasions and its general laws. The investigation of these laws is the task of psychology. Psychology has to explain these views, but not to create them, just as it is the task of æsthetics to explain works of art but not to produce them. If we seek to understand philosophical systems as thus psychologically necessary, we find that these systems do not create the views of the world, as men usually have thought, but rather these views have produced the systems. Bruno's philosophy is only the expression of the universal freshly awakened spiritualisation and deification of nature which was characteristic of his age; and even a system that appears so personal as Spinoza's, clearly reflects the scientific mode of thought of the century in which it arose. Spinoza sought to reconcile the new conviction of the mechanical necessity of every event in nature with the aspirations of the human spirit, and to make just this necessity the basis of the knowledge of God and the source of peace for the soul.

So these systems are partly the expression of the ruling scientific convictions of their time, partly the witnesses to and the reflection of that which is called the public or collective spirit of a period. The examples of the Copernican system, the mechanics of heat on the

basis of the persistence of force; and the Darwinian theory of descent and development, have shown historically that the scientific elements of the theories of the world have not been discovered by the philosophical systems, but the systems have obtained these elements from positive investigation.

§ 4. If the field of knowledge were exhausted with the problems to be treated by exact investigation, philosophy could no longer be regarded as a particular definite science in connection with the other scientific disciplines. The old form of science, philosophy, would be supplanted by the newer form; the positive science of our own day would take the place of Greek science.

But in the progress of knowledge another problem has been coming into view more and more distinctly, the treatment of which demands a particular trend and practice of the psychical powers. According to the principle of the scientific division of labour this is destined to become an independent province of knowledge. For historical reasons this province may bear the name philosophy in the narrower sense of the word. It is to be regarded as the special science of philosophy. Even in antiquity the beginnings of this science may be discovered along with the beginnings of the positive sciences, astronomy, cosmology, physics, psychology, &c., in so far as a certain degree of reflection as to the conditions of knowledge and the criteria of certainty may be found among individual Greek thinkers.

The real foundation of scientific philosophy is however the work of modern time—it is introduced by Locke's *Essay on the Human Understanding*. When study began to be turned inward, when the power of the mind began to be investigated and the subjective basis of knowledge tested, as Locke attempted to do, in order to discover whether the mind really had the capacity for dealing with the things with which metaphysics had been occupied, then the proper sphere of a true

scientific philosophy was discovered. Instead of dealing with nature, which is the object of experimental investigation, philosophy deals with the conditions of the knowledge of nature. Instead of assuming the appearance of an all-embracing knowledge, it avoids the misuse of concepts that systematise knowledge. Its negative task is the criticism of these metaphysical concepts. It attacks metaphysics, and not only the open metaphysics which extends itself in whole systems, but also the latent variety which finds a place unseen in works of science, and which cannot be set aside without criticism of concepts. Its positive aim is the explanation of science itself. Philosophy is the science and the criticism of knowledge.

There is a scientific investigation which aims to reach directly the essence of knowledge, the result of which determines what we shall call by the names: science and experience. This investigation is philosophy, which teaches us not this or that science, but *the* science, and in distinction from the particular disciplines exemplifies the general scientific spirit. Philosophy serves the same office for general experience deposited in science, as does self-consciousness for individual experience; it is the self-knowledge of science, knowledge brought to the understanding of itself.

There was a philosophy which preceded science and has been supplanted by science. There has also been a philosophy which sought to appropriate for itself the place of science, but which has gone to pieces on its claim to a higher than scientific knowledge. True philosophy follows science; in constant connection with science, it is ever obtaining a clearer and more complete understanding of science.

The simplest method of proving the correctness of this assertion is by classifying the different problems treated under the name of philosophy. One division of these problems, such as the questions of cosmology,

of general physics, and of biology, belongs to the class of topics which the old philosophy had in common with modern science; a second class includes the problems of metaphysics, the questions as to the essence of things, the first cause of the world, &c.; a third class is constituted by the problems of the psychological sciences, including the positive part of ethics and æsthetics; and the fourth class includes the problems of criticism and the theory of knowledge. The questions of natural science have long since ceased to be treated by the method of philosophical speculation, so that there can be no doubt that they are objects of experimental investigation and of this alone. It is equally clear to us to-day that metaphysical questions can expect no scientific answer, that there is no science of metaphysics. Some doubt may arise as to the relation of the psychological sciences to philosophy. But one who has observed the present development of these disciplines can scarcely deny to them any longer the character of independent branches of science. There remains for philosophy in the narrower sense of the word no other problems than such as are treated by the critical science of knowledge. This science therefore is philosophy.

§ 5. The science of knowledge does not coincide with logic. The latter forms only one part, the pre-eminently descriptive part, of theoretical philosophy. Elementary logic deduces from the principle of identity or the fundamental principle of the agreement of thought with itself, the rules according to which the necessity of conclusions may be known on the supposition that the premises are true. As theory of method, logic describes the process of obtaining, proving, and systematically arranging the general principles of science which serve as the major premises of our syllogistic reasoning. The science of knowledge furnishes the explanation of this description. It traces back the scientific methods to their presuppositions or principles, and investigates the

conditions and the sphere of the real validity of these principles. Its relation to the reality of knowledge distinguishes the critical science of knowledge from formal as well as from descriptive logic.

Psychological analysis avails no more than purely logical, to solve the problem of the theory of knowledge. It was an error of Locke's to believe that the knowledge of the origin of concepts is immediately identical with the knowledge of their meaning. Every theory which attempts to explain the historical development of concepts, whether it relates to development in the individual or in the race, must presuppose the possibility of knowledge in general. The investigation of this is the proper task of a critical science of knowledge.

§ 6. Since Socrates turned aside philosophy from speculation about the world of things to the study of the relations of human life, philosophy has meant something besides a single definite science or the totality of scientific disciplines. Since that time two conceptions, different and not homogeneous, have been connected under this name ; and there has been no more important or more fatal error in the history of philosophy than the failure to recognise this difference, to which Plato gave occasion and example. The improper application of an ethical or æsthetic idea to the explanation of natural processes, when such an idea can only serve for the judgment and direction of human actions, is the source and the meaning of all Platonism in philosophy, by which I mean the effort to reach an ethical view of life and an explanation of things on the basis of one and the same principle. Plato transformed the Good, *i.e.*, the truly and enduringly useful, as Socrates defined it, into a transcendent being, and made it the cause not only of knowledge but of the very existence of nature itself. This conception, which has its origin in human society, loses every definite meaning when separated from its relation to society. The Good is not a ground of explanation, it is only a standard of

judgment, and this not for external nature, but simply and only for the character and actions of men. The introduction of practical concepts, especially the concept of purpose, into external nature, makes the knowledge of this difficult if not impossible. Nature, or as metaphysicians say, the ground of nature, cannot be thought as equipped with moral qualities, except when uncritical anthropomorphism is given loose rein. On the other hand, the belief that life in accordance with nature is itself already moral, may be called a "naturalism," with which man gives up his acquired rule over nature.

Aristotle found fault with the natural philosophers of the pre-Socratic period because they had made scarcely any use of the principle of the Good or of purpose, but we must regard this as an excellence of their mode of thought over the Aristotelian. And yet Aristotle himself, from another standpoint, arrived at the distinction between theoretical and practical philosophy. When he refuses to regard the latter as a science in the strictest sense of the word, because the standard of absolute exactness cannot be applied to it, we are obliged to accept his view, although for a different reason and with certain limitations. Certainly there is a scientific side to ethics. History and comparative psychology furnish it with material and method. There is another side to it, however, which is directed toward the future and concerned not with facts but with tendencies, not with what is and happens, but with what ought to be and to happen; on this side undoubtedly it extends far beyond the limits of a science in the proper sense of the word. The fact that it sets up norms is a sufficient proof of this. For science as such does not know the concept of norm and of the ought. That which we call abnormal, judging from the practical standpoint of utility, of life-vigour, or of beauty, is just as important and often more important to it than what corresponds to the norm. Its propositions, rightly understood, can never be the objects of moral or

æsthetic praise or blame. They are neither moral nor immoral, but simply either true or false. On the other hand, norms or practical ideals do not so much lay claim to truth as to fitness and obligation. They *are* not true, they only become true when we believe them and act in accordance with them. Truth does not give to a natural law the authority of a moral law, for the authority or obligation of a moral norm proceeds wholly from its social meaning. It is only a confusion of their proper province which makes it seem possible for scientific concepts to clash with practical ideals; but it is easy to overlook the fact that they represent different directions of the mind, and have different interests to serve.

In modern times Hume has shown a very clear understanding of the double meaning and the double purpose of philosophy. "The science of human nature," he says, "is twofold, and each part serves its peculiar purpose. The one regards man especially in his capacity for action, and its course is guided by taste and feeling. The second regards him pre-eminently as a knowing being; it seeks to develop his mind, and it treats nature as the object of speculation or science." Kant's distinction between a "world-concept" and a "school-concept" of philosophy really belongs here. According to the first conception, philosophy should mean the relation of all knowledge to the ends of reason, while the second makes it a particular, definite form of knowledge, according to Kant a science of pure concepts formed by reason. This view loses none of its value if we no longer regard the ends of reason as Platonic essences, which are given as objects (indeed this was not Kant's opinion), but rather as ideal tasks directed towards the future, which man must set before him, if he is to carry on the work of nature with wisdom and skill: Finally, in our own day Dühring has drawn the line sharply and effectively between philosophy as science and as dealing with character.

§ 7. The theoretical view of things is separated from the practical, even in its psychological root. It starts with sensations which consciousness receives from without, while the practical view grows out of the feelings with which consciousness reacts toward these impressions. The goal of the first is knowledge, the foundation of the second is the worth of phenomena. As no quality of a thing could be given without sensation, so nothing could gain any importance without feeling. There is, no doubt, an essential difference between the question, *What things are*, for sense and for the intellect, and the question, *What things mean* when judged by our feelings. It certainly makes a difference whether we attempt to trace the processes in nature back to their last assignable reasons, or whether we seek to express the reaction of our mind in view of these processes.

Science regards man, so far as he is a natural product, as a result of general laws; practical philosophy applies to him so far as he is a cause in nature, a being who by his knowledge of the law of nature can realise his purposes in nature. The knowledge of human nature gained by science is, indeed, the starting-point of this philosophy; but it discovers in his nature dispositions, the development and perfection of which is left to the man himself. Its realm is not the real but the possible, that which may be created by the will and the power of man. It proclaims future possibilities which are not, and cannot, be present as objects for theoretical study. It gains the assent of the mind, not by proof, but by awaking the belief in something better which man can call into existence.

Practical philosophy is wisdom in the art of living; it is the true teleology, which makes the right use of the concept of purpose, a principle not for explaining the external world but for developing conscious life. In so far as ends hover before our action as typical conceptions, we call them ideals. Philosophy has always

accepted the practical task of aiding in the formation of the general ideals of mankind. It accomplishes this task by transforming the consciousness of ideal aspirations from a state of indefiniteness and simple feeling, which may easily lead to fanaticism, to a definite form controlled by the intellect, and connected with man's insight and science. Philosopher does not mean simply teacher of science: in his practical vocation, the philosopher is, as Kant calls him, the teacher of the ideal. On the basis of science he is to defend the universal interests of mankind.

In this second meaning of the word, according to which philosophy is not itself a science, but an independent and peculiar product of the human mind, parallel to science, art, and religion, it teaches men to believe in man, and in the good which he ought to produce. It preserves this faith in him even against certain false inferences, which have been drawn from science. It refutes the fatalistic meaning which is generally given to the conception of the universal reign of law in nature, and shows men how to assert and to extend their rule over nature.

Philosophy is twofold; it includes the general theory of science, and the theory of practical wisdom.

CHAPTER II.

THE LIMITS AND PRESUPPOSITIONS OF KNOWLEDGE.

§ 1. THE effort to determine the limits of knowledge, not unreasonably arouses suspicion. It seems to place too high an estimate on the results of science hitherto attained, or even to conceal behind it some purpose hostile to knowledge. For this reason, the phrase "presuppositions of knowledge" is to be preferred, since presuppositions do indeed set limits to investigation, but only because they are the very means of investigation and point out its course. One cannot ask a proof for the assumptions, in accordance with which all proofs must be conducted.

The confusion between the presuppositions and the limits of knowledge, has led men to assert that the human mind works in a particular way, and to lament the inability of our minds to penetrate into the essence of things. Sensation is falsely regarded as a barrier to knowledge, while, in fact, it is the very condition of knowledge. After the imagination has formed all sorts of transcendent conceptions of a mind that is intuitive, *i.e.*, perceiving without the senses, it is regarded as a peculiar limitation of the human mind, that it is only able to apprehend phenomena. The very concept of knowledge involves both subject and object, separated from each other in order that they may be brought into relation with each other. And how can any one be so certain of the fact that the phenomenal appearances of things are any less than the things behind phenomena?

A division within the power of knowledge itself, such

as Kant constantly makes between understanding and reason, which, he says, limit each other reciprocally, must mean the destruction of knowledge and not its limitation. The so-called Dialectic of the pure Reason is accordingly no conflict between the functions of knowledge, but only the conflict of science with metaphysics.

There are, undoubtedly, limits to observation. It cannot be made absolutely perfect, and the help of instruments can only extend its limits up to a certain point, not remove them completely. Farther, the conditions of a single definite phenomenon are, in most cases, so complicated that they cannot be completely analysed. But what escapes observation need not on this account remain hidden to the mind, and no complication, however great, in the circumstances of a phenomenon has any lasting power to prevent the mind from ascertaining the laws that govern the causes of this phenomenon.

There are degrees in the exactness of knowledge; but even these degrees do not stand fast for all time, and, moreover, there remains the opportunity to bring the less exact knowledge into connection with the exact, as, for example, some parts of psychology to-day are brought into connection with physiology.

If only that knowledge is to be called exact which is attained by the mathematical measuring process, used in the investigation of external nature, then the definition of exact knowledge must indeed exclude that part of knowledge which has most meaning for us, the investigation of internal nature, the knowledge of man, and of the products of his mental activity. But why is it necessary to form such a limited idea of exactness? Rather Dühring is right in saying, "True exactness, accuracy in a more general sense of the word, must be attainable everywhere where the student will decide to distinguish candidly between what he knows and what he does not know, and to determine and state accurately

how he knows it, and the source of this knowledge." ¹ Hume's *Treatise on Human Nature* is no less exact in this sense of the term than a treatise on theoretical mechanics. Whoever tries to overlook this, confuses the means of exactness with exactness itself.

§ 2. No limits can be set to scientific knowledge from without, either by religious or by metaphysical systems which would condemn it eternally. But it sets limits to itself in that it distinguishes itself from other ways of apprehending things. Phenomena are given not only for the understanding and for science, they affect the æsthetic sense and the spirit also, and the spirit reacts on them in its own way. The world around us is not to be apprehended by concepts alone, but science only reaches as far as the conceptual element in phenomena, as far as they are connected according to the category of cause and effect.

Although only such external limits can be set for science as it sets for itself in order to be science—nothing more and nothing less—it may still have inner limits, in so far as it is not possible to pass from the field of one science into the field of another. Such limits seem to exist in fact between the sciences of nature and the sciences of spirit. Can there be any deeper antithesis than that between mechanical events and psychical acts, between processes which are determined according to number and measure, and those to which the concept of quantity has only mediate application?

External and internal experience, although they are united in one and the same thinking subject, undoubtedly mark an antithesis of direction in this subject's apprehension. But inasmuch as every fact of experience is the consciousness of a phenomenon, of an effect on sense and the understanding, that antithesis cannot affect the content of knowledge. The same phenomenon, *e.g.*, the sensation of a pressure, which we designate as physical or mechanical as long as we take into consideration that

¹ Dühring, *Logik und Wissenschaftstheorie*, p. 324.

side of it which is subject to measurement (*i.e.*, numerical comparison with phenomena of the same sort), we call psychical if our attention is directed to the side of it which is directly perceived and felt. That which we distinguish as stimulus of the sensation, and reckon as part of the outer world, remains nevertheless a phenomenon, an effect on our senses.

The limits of knowledge for natural science are simply the beginning of psychological knowledge. But only when both kinds of knowledge are taken together, does there arise the complete knowledge which is possible of phenomena. A celebrated speech on the limits of our knowledge of nature, had as its real subject the limits between natural science and psychology, in so far as it taught that a complete knowledge of the physiological processes which take place in the brain during sensation, would not explain sensation; *i.e.*, that the mediate knowledge which we have of the brain as a phenomenon for external sense cannot replace our immediate knowledge of it.

§ 3. Mind cannot know the essence of things—the assertion is repeated till men are tired of it. Have things, we may ask, any essence outside our mind? Is not that which we call their essence a creation of our thought? That which is constant and uniform in phenomena as we experience them, we regard as their essence, for we can only understand phenomena in general on the basis of constancy and uniformity. According to the concept of essence is a teleological concept of logic.

In order to distinguish the essential from the non-essential, phenomena are classified under the concepts of genus and species. But as certainly as these concepts are creations of our own mind, so certainly is the essence of things which depends on them and is only known through them, a product of thinking. This essence changes with the connection into which a particular

phenomenon is brought by thought, so that the same phenomenon has different essences. It is only necessary to think of systems of classification in which the principle of division determines the essence of the objects subordinate to it. As the same group of things may be classified in several ways, the objects themselves assume a new essence with each new classification. The fact that negative attributes, the absence of certain elements, may be part of the essence of an object, shows most clearly the purely logical character of the concept which is designated by the word essence.

The quantitative agreement of successive phenomena forms the essence of their causal connection, for this agreement alone corresponds in thinking to the connection of cause and effect. We can only infer from like to like, and accordingly we seek to prove the identity of one and the same process in events that are apparently different and succeed one another.¹ For natural science the motion of masses is the essence of material processes, because only this motion can be subjected to measurement. The same phenomenon which one science regards as essential, seems to a second non-essential. So it makes an essential difference to physiology whether an extremity develops into a fin, a foot, or a hand: for the theory of development, this difference has no essential meaning; on the basis of comparative morphology and the history of development this science proves that the fin of a shark, the hoof of a horse, and the hand of a man, are homologous or essentially the same organ. The concept of essence is not merely logical, it is at the same time relative.

If we in a certain sense make the essence of empirical concepts, the content of which is given by experience, this is even more clearly the case for concepts which

¹ Axel Harnack suggests the same in a lecture that well deserves attention, "The Investigation of Nature and the Philosophy of Nature," Leipzig, 1885, p. 25.

express the activity of our mind or, avoiding psychological terminology, the general relations of thought. The essence of these concepts is wholly open to knowledge. In all our knowledge it is just this "intelligible" behind which the metaphysician seeks we know not what secrets, that of necessity we may know exhaustively; while perhaps we can only know the "sensible" approximately, because the complete understanding of a single definite phenomenon presupposes the understanding of a very great number, practically an infinite number, of other phenomena. That which is given to us, we know only so far as it is given, and in the manner in which it affects our sense; that which we add by thought to a given phenomenon in order to unite it into a homogeneous experience must for this very reason be completely open to our knowledge. What matter is in itself, *i.e.*, apart from the sensations by which alone we know matter and are sure of its existence, is wholly beyond our powers of investigation, and so the question is an idle one. What substance is in itself or in its essence, we may know completely, because the concept of it is formed wholly in the mind. To think something, *e.g.*, the body, as substance, means to use the concept of this something as subject of the judgments which relate to it, to treat it as existing independently of our thought, and as persisting through the changing circumstances into which it enters or may enter, to presuppose its identity with itself. The whole essence of the concept which we call substance, consists in these relations.

So thinking creates the distinction between essential and non-essential, as it does the distinction between necessary and contingent. Not things themselves, but our concepts of these things have an essence in the proper sense of the word. Accordingly we know nothing about them so well as we know their essence.

§ 4. The essence of things is beyond our powers of investigation : certainly, if one names that which cannot be

investigated, the essence of a thing. But if this assertion aims to express a comparison as to value between phenomenon and essence, between what we know of things and what we do not know, not the least reason can be given to confirm it, because it is evident that unknown things cannot be compared with known phenomena, but only phenomena with phenomena. For subjective reasons man is inclined to overestimate the value of the unknown and to prefer it to the known. His practical dissatisfaction with reality exercises an influence on his theoretical consideration of it. Not only has it repeatedly led astray one of his noblest impulses, his effort for the gradual attainment of perfection, but it has also inspired his spirit to metaphysical inventions of a super-real world.

Out of what lies at the basis of phenomena, which abstracted from the phenomena is really less than what is known to sense, Kant, following Plato and the Eleatics, made a supersensual thing, a noumenon. To this problematic object, as he himself called it, he gave an equally problematic, intuitive understanding as correlate. The familiar, discursive understanding is indeed able, he says, to penetrate to the concept of a thing in itself, because it can apprehend perceived things as phenomena, but it has no power of its own to determine this concept more exactly. The determination of this the reason undertakes with its ideas, especially with the idea of a most real being.¹ In this way Kant transforms the thing in itself, which properly conceived is only the correlate of phenomena and as such must be known through phenomena, into a sort of higher being, a noumenon. Moreover, it is not the theoretical reason which experiences this amphiboly of conceptions; the practical reason, as Kant believes, demands this change in order to make

¹ Kant's *Werke* (Ros), i. p. 397, where it is explained that we can determine our conceptions of things in themselves only by "first reducing all reality to the concept of God, and according as it exists therein, applying it to other things as things in themselves."

the field free for its postulates: in other words, its hopes, and wishes.

The concept of a thing in itself serves to connect the phenomenon with our idea of independent reality. It is indispensable for every one who does not regard his sense impressions as without foundation. The concept of a noumenon, on the contrary, is a practical concept of an ideal; it leads Kant into open contradiction with his doctrine that things in themselves are unknowable, by lending to these things a higher value than to phenomena in the consciousness of man. He who does not regard wishes as reasons, must withhold his assent from such a judgment of value as this. If a purely theoretical treatise is to discuss determinations of value and not rather to make things intelligible and to prove propositions, the natural conclusion from analogy would be the contrary, namely, that the preference must be given to phenomena rather than to things. As conscious life is more than life, life more than the absence of life, so the phenomenon which presupposes life as consciousness, must mean more than the thing that appears. And the meaning of the phenomenon will necessarily increase in the same ratio in which the consciousness to which it appears, attains a higher degree of development. Can we doubt that the same world of things assumes a higher mode of existence in the consciousness of man, that it obtains therein a richer content, than when it is represented in the consciousness of an animal, since we know that there are such great and important differences of value and of meaning even in the apprehension of things by men?

What we experience, is the effect of things on our consciousness. So necessarily we remain separated from the proper being of everything by the phenomenon or the idea. But only a philosopher of the absolute who is able to represent things as they are outside of all representation, can see any limitation of knowledge in this necessity which is the very condition of knowledge. To prefer the

identity of being and knowledge, that dream of the metaphysician, to their antithesis, really means to prefer the absence of consciousness to consciousness. In fact being and knowledge cease to be antithetic in the moment when consciousness goes over into unconsciousness. When one comes to himself after a faint, or arouses from a dreamless sleep, he comes back from the realm of things in themselves; he has gone over from the condition of mere being (being for others), into that of conscious and felt being (being also for one's self).

§ 5. Phenomena depend both on the character of the sense activity and on the form of the stimulus which sets this activity in motion. Therefore in experience there can be no purely physical fact, and similarly there can be no purely psychical fact. The facts of experience are psycho-physical phenomena. We can know the change of one object in the external world as compared with another only when our perception of the objects experiences a change simultaneously therewith. Every relation which we perceive or presuppose as existing between things themselves, is primarily only a relation between our sensations. Even the perception of self (if the word perception may be permitted) is only possible through the consciousness of antithesis to some external perception. Phenomena, and one deals only with phenomena in experience, are relative in general because they are related to some consciousness, and in particular because the external phenomena stand in an indissoluble relation of antithesis to internal phenomena. This fundamental fact of sense consciousness is called the principle of the correlation of subject and object.

The mind is so inclined to personify abstract relations, the earlier metaphysical mode of thought still exercises so much influence on scientific thought to-day, that this principle is constantly forgotten, and now one element, now the other element of sense knowledge is separated

from its correlate and made independent. If we devote ourselves to the study of the objective side of experience, its subjective side slips out of sight, we believe in the absolute reality of matter and motion as these appear to the senses; if we reflect on the subjective side, we easily fall into the opposite error, we ascribe to psychical phenomena a far greater immediateness and independence than they actually possess. We create by materialistic or spiritualistic hypotheses an antithesis between matter and mind, *i.e.*, we make substances out of our abstractions. Then we institute those vain attempts to deduce the psychical from the physical, or to understand the physical by means of the psychical, which in fact mean nothing else than the attempt to deduce the subject from the object, or the object from the subject, *i.e.*, to abolish the fundamental supposition of all knowledge.

§ 6. The right form of statement means the same for a metaphysical problem as for a mathematical equation. If the question is put: How can sensation and consciousness arise out of atoms and motions of atoms? no answer is possible, for the very reason that the question is falsely stated. Oddly enough, we get the impression that atoms are given before sensations and are better known than these, so that, we know not how, we afterward come into the possession of sensations. If, however, we start with what really is originally given in experience, namely the consciousness of sensation, and ask how we arrive at the assumption of atoms, the question is rightly stated, and by this right statement is already nearly answered. Evidently we infer the existence of atoms from our external perceptions, *i.e.*, we infer them in the last instance from our sensations. The assumption of atoms to explain a series of facts in our external perception, satisfies the need of the mind to derive the largest possible number of phenomena from one and the same concept. And the reason why we explain external processes by atoms and not by Leibnitz' monads, is

perfectly clear. Natural science must abstract from the qualities given in perception, so far as possible; it can only consider the formal and the homogeneous, because only quantities of the same kind can be subjected to its mathematical processes. So it treats all qualities as symbols for quantities. For the real body with its attributes which we feel, it substitutes an ideal or abstract body which takes the place of the former in its calculations. Then it uses the reverse of this process of abstraction, as often as it desires to return from the atoms to sensation, from the abstract or reduced phenomenon to the complete phenomenon.

Such is the power of habit that, as Hume remarks, it may acquire the strength of an original impression. Only the student's constant habit of thinking about atoms, makes these products of his own abstracting process seem to him more real than the sensations from which they are derived. He seems to forget that the existence of atoms may be doubted and is doubted, while there can be no question that sensations exist. And granted that the assumption of atoms stands in contradiction with the fact of sensation, it must be changed until it can be united with this fact. But in truth it is only the belief in the absolute existence of atoms that makes it impossible to believe in the existence of sensations. He who regards atoms as things and sensations as the effects of these things, creates an antithesis between the cause and its effects, which no idea can harmonise again. No wonder that the connection of the two is regarded as beyond our power to investigate; that it is regarded as a limit of knowledge, rather than simply a limit of this method.

Evidently sensation finds no place in the complete chain of motions which the scientist follows with his mental vision. It is not itself motion, nor can it be thought as a mere result of motion. So the scientist must regard the starting-point of his study, the basis of

all his inferences even for the knowledge of motion itself, namely sensation, as something which really does not exist at all—if we grant that natural science can still exist. But why is it necessary to step over into the sphere of the transcendent, and regard matter and motion as absolutely real, as facts that must exist outside our thought in the same form in which we think them, *i.e.*, the form in which they affect sense and understanding? But if he takes the undoubtedly correct standpoint, the critical, according to which every phenomenon exists only in relation to our perception, his question ceases to be a metaphysical puzzle. He recognises that motion as he perceives it is a phenomenon, and finds it perfectly clear that sensation cannot be deduced from abstract ideas such as the idea of atoms.

§ 7. Sensations have been regarded as signs for certain processes in the object, which are thought to consist exclusively of motions of a substratum without quality, of body in general. If all sensations are to be mere signs, the question arises, how we arrive at the knowledge of what they stand for. In fact, one sensation is the sign for another connected with it or immediately following it; the idea derived from one set of qualities is the sign for an idea derived from another set of qualities, another sphere of sense. What we call the sign, and what the thing for which it stands, depends partly at least on our standpoint. A being who thought ordinarily in ideas of smell, as we do in ideas of touch and vision, would have made a different division between primary and secondary qualities, from that made by Locke. Such a being, if it had the power of reflection, would consider smells as the essential attributes of things, while extension, form, and motion would be the effects of things on his sense-consciousness. All physical laws are fundamentally laws of our sensations: the conditions constant, uniform, and agreeing with experience, under which we arrive at definite sensations. Every physical fact is the sign for

a definite psychical fact, which, however, belongs to another set of qualities. In our scientific investigations of nature, we generally leave this out of account, and occupy ourselves solely with the signs for sensations. But there is no question that a purely physical fact is a creation of our abstraction. Or do men really believe that they can drop out nerve and brain in investigating external nature? It is only by following sensations that we get any knowledge at all of the external world, and what is to be regarded as real, must be connected with a sensation. To verify the hypotheses which we form of the processes in the external world, means to prove their connection with sensation and direct perception.

The external world, which we only know through our sensations, includes also the brain which we see and investigate. It is given only as phenomenon for a second brain which sees and investigates. If the physiologist is to regard sensations as merely phenomena that accompany certain processes in the brain, the psychologist does right on his part to reverse this point of view, and to treat those processes in the brain as phenomena accompanying sensation. Both points of view are alike correct, they express one and the same fact as seen from different sides. Only we must be on our guard against drawing the conclusion immediately that motion and sensation are parallel. Motion is an idea derived from the relations of our sensations in space and time, and the derived cannot be made parallel with what is original (in the phenomenon).

The desire to know what motion is in itself is nothing but the desire to observe without sense. Motion assumes an entirely different character for the sense of touch which feels its impulse, and for vision which follows its traces in space. Strictly, what we perceive of it with the one and the other sense, is not the way an object begins to move or accomplishes its motion from one position in space to another, nor even this transition

itself, but the fact that it has moved to the second position. We perceive that in the following moment the object has assumed a new relation to the relatively constant sensations of space which occupy the field of vision or stimulate the sense of touch. But the continuity which we ascribe to motion, is something we add to our idea of it, as we bring it into relation with absolute space and absolute time, *i.e.*, with the totality of our external experiences.

When we explain processes directly perceived by motions which escape direct perception, we do not even then leave all connection with real sense-perception or phenomena. We think those motions as possible perceptions for our external sense, *i.e.*, we proceed to think beyond the limits of direct perception in the mode of apprehension common to the senses. Even the atoms, the bearers of those invisible motions, we think as possible objects for the senses of touch and sight. We give them the attribute of impenetrability, which is an idea of the sense of touch; we give them extension and form, and so bring the idea of them into relation with the sense of vision; briefly, we think them as they would appear to us, if we could perceive them with both these senses. And if the abstraction from our sense-perception is carried still farther and the atoms reduced to mathematical points, still in thought we must put our field of vision at the basis of our idea of their motion. The empty space which we have to assume in order to carry through the atomistic hypothesis consistently, is nothing else but our ideal field of vision, with which in the last instance we must bring into relation the idea of every object in space. Even the most abstract ideas which physics and chemistry use in their theories, are fundamentally ideas of psycho-physical phenomena, which as such stand in relation with the mode of intuition of our sense, and are derived from real intuitions of sense.

§ 8. When once we have given up faith in the absolute

reality of atoms and motions of atoms—and we must give it up as soon as we take into consideration the conditions of sense knowledge, the relativity of phenomena—most of those difficulties disappear which have surrounded the question as to the connection of physical and psychical phenomena. This connection will be investigated empirically instead of metaphysically, whether the metaphysics be materialistic or spiritualistic. Instead of setting a limit to knowledge where none exists, we shall correct our ideas of the nature of sense knowledge.

The very same process, the character of which is not yet known, is perceived as tone when it affects the hearing, as motion when it comes into connection with touch and vision, or is related to these senses in thought. In itself it is no more motion than it is sound. It becomes one or the other, as it is brought into relation, in thought or in reality, with the respective senses. When the cause of a sensation of sound is said to be the vibrations of a body which are communicated through a medium to the inner parts of the ear, and then to certain parts of the surface of the brain which are connected with the *acusticus* fibres, we do not regard this process as the proper cause of the tone-sensation itself, though we do not question its reality in the least. In fact this process is the phenomenal appearance of the cause, as its external parts are represented to the vision when we let a tuning-fork record its vibrations, and as it would be represented in all its parts to the same sense if we could follow the process in its whole course to the very end with the eye as we can follow it in thought. And what applies to the sensation of a sound, applies similarly to the sensations of smell, taste, and temperature; it applies even to the qualitative impressions of external sense, to colour, hardness, smoothness, &c. None of these sensations has a motion as the real cause of its distinctive character, but some unknown quality of the stimuli. But in our thought we put motions, *i.e.*, ideas of external sense, in

the place of these unknown causes, in order to make them more objective and to subject them to measurement and calculation. So when we say that motions correspond to sensations, this is to be understood as meaning that there correspond to sensations processes which appear to the external senses of touch and vision as motions, and which must be thought as motions in the mode of thought proper to these senses. Motion also is part of the phenomenal world, because nothing which the senses perceive can be a thing in itself or the action of such a thing.

In the case of other than spatial sensations we do not find it easy to forget their relations to their respective senses, and on account of this relation we are inclined to regard them as something entirely subjective. But ordinarily we forget that the spatial sensations of extension and impenetrability and the idea of motions derived from these sensations can only exist for their respective senses, touch and vision, just as sound exists for hearing and warmth for feeling. It is easy to discover the reason for this. We form the idea of an object out of spatial sensations, and because the idea continues in fact to exist and to stimulate consciousness after the perception itself has ceased, we erroneously ascribe to those sensations an existence independent of all relation to our perception. It is certainly a strange and inconsistent theory which asserts that all other sensations give us only the way in which things affect our senses, while the sensations of solidity and extension and the ideas derived from them reveal to us things as they are in themselves, apart from their effect on the senses of touch and sight. This philosophy of Locke is still the philosophy professed by natural science. In the constitution of a sensation there can be nothing absolutely subjective and nothing purely objective; the feeling which the perceived content stimulates in consciousness, is the only decidedly subjective element in sensation.

The sensations of vision and touch are distinguished from other sensations by their relative persistency, and their immediate relation to the perception of space; the former also by their comparative freedom from feelings. Accordingly, they are far better fitted than these to represent reality as independent of us, and to reflect the relations of this reality by their arrangement and their interconnection. So we designate the perceptions formed from them as things, and the content of these perceptions as the attributes of things, while we prefer to call the characteristics which we learn through the other senses the effects of things: although in truth extension and motion are just as much phenomena, *i.e.*, effects of things on our senses, as colour and taste. Our objective world consists of real and possible perceptions of touch and vision—of mass, energy, and motion—not of smells, sounds, &c.; and the reason is that we only call objective what we perceive through the two spatial senses, and think in the mode of thought proper to these senses. In the scientific development of this image of the world we leave out of sight as far as possible the specific stimuli of the so-called senses, namely, colour, smoothness, hardness, &c.

We first disrobe the external world of all qualities, and then find it inconceivable how it can assume these qualities by the mere introduction of sensation, how qualitative differences can be deduced from purely quantitative differences. The correct answer is that we have made this inconceivability ourselves. If we consider, farther, that the abstraction from sensations can never be completely carried through so long as we still think of objects, that motion still remains a specific idea of sense, and not a purely formal one, the whole secret of the relation of motion and sensation is revealed to us. It is the well-known, undoubtedly true fact that sight and touch are something different from hearing and smelling, the fact that we have different senses, and that it is not possible

to derive the qualities given by one sense from those given by another. The desire to deduce a sound from a motion is simply the desire to deduce a sensation of sound from a sensation of vision.

§ 9. Our ideas of descent and development in organic nature make the conclusion unavoidable that the specific sensitiveness of the sense-organs must have gradually developed. This thought of a common origin of the senses finds its confirmation in the differentiation of the senses from the ectoderm of the embryo; in the very great difference of structure in one and the same sense-organ, *e.g.*, the eye; in the absence of specific senses among lower animals, &c.; and I believe that it is further confirmed on the psychological side by the remarkable fact that even to-day there exists a certain relationship between the qualities of the different senses, in spite of their lack of homogeneity. The fact that we speak of high and low tones, of sharp and dull tones, of warm and cold colours, points with considerable probability to the sense of touch and temperature as the real fundamental sense. But we seek in vain to form a clear idea of the descent of specific qualities from an original undifferentiated state.

We do not know the characteristics of stimuli which have as their result those qualities. So long as a nerve (or the organ homologous to a nerve) was not made sensitive to light, it goes without saying that there could have been no sensation of light. The process which led to the development of the specific sensitiveness of the *opticus*, is beyond our power to investigate, since the characteristic of the stimulus before and outside of sensation is unknown. We cannot perceive the external world in any other way than by the help of the developed senses which we have, nor can we get ideas of the differentiation of the senses in any form other than in the mode of apprehension of the differentiated senses.

The origin of sensation cannot be the object of possible experience, because experience begins with sen-

sation. We can only investigate the conditions for the sensation of one sense through the perceptions of another sense; *e.g.*, the conditions for a sensation of sound, through the perceptions of sight. This process cannot be regarded as a deduction of sensation itself. Rather such a deduction becomes evidently an impossible task, for there is nothing in experience more original than sensation. We know that sensation arises, but we can form no idea of how it arises, since every idea, even the idea of motion, has sensations as its content and its presupposition.

It would not, however, be correct to treat sensation as absolutely simple, because it is the material element of our knowledge. It is not only the consciousness of having a content, but, at the same time, the consciousness of being affected by a perceived content. Through the feeling with which it stimulates consciousness, the sensation reveals something which does not originate exclusively with ourselves. And not merely single sensations taken by themselves, but their definite relations of simultaneity and succession, exercise a power over consciousness which proves that sensations point to a reality outside ourselves, so that through them and their relations we get a mediate knowledge of things themselves. Sense knowledge is the knowledge of the relations of things through the relations of the sensations of things.¹

§ 10. Consciousness itself is no more to be explained than the sensation which forms the fundamental part of

¹ Kant, who occasionally pointed out this meaning of sensation and empirical intuition for knowledge, did not go into the matter any more fully because he was writing a critique of pure knowledge, and not a theory of empirical knowledge. So it is unreasonable to criticise him for not investigating more carefully synthetic judgments through experience. Kant cannot, however, be exonerated from the charge of having overestimated pure knowledge. It has always seemed to me that the proof that things in themselves cannot be known by pure intuition and pure thought, did not include the proof that they cannot be known by empirical intuition and empirical thought. It is impossible to infer the second directly from the impossibility of the former (metaphysical) knowledge, and the statement that things in themselves are unknowable, is true only with the limitation—through reason alone.

its content. Nor can it be separated from this, its content. A consciousness which is not related directly or indirectly to some sensation, is the mere thought of a consciousness which we designate by the word "I," and the form of which we can point out in the uniting of sensations, but cannot think by itself.

Every possible explanation of consciousness must evidently presuppose consciousness itself. Or how is one to think of an explanation which does not take place through and for consciousness? In order to understand the meaning of this statement, we must distinguish consciousness in general, the mere form of apperception, from the empirical self-consciousness which Kant termed the inner sense. This empirical self-consciousness has a history of its existence and its pre-existence. It experiences an individual development and a degeneration, and it is broken by periods of unconsciousness. It is, therefore, the object of a psychological and psychogenetic study, which explains it from its conditions, and follows its development. But the form of consciousness in general, the pure *ego*, remains always at its foundation as the point from which all explanation starts, and to which it is in constant relation, and which, therefore, is not itself to be explained.

The effort to observe consciousness as such, and to investigate it, involves the transformation of it into an object for a second, as it were a deeper consciousness. It escapes the thought that would apprehend it, the observation which seeks to hold it fast as an object. It is the form of all phenomena, and as such it cannot at the same time be a single definite phenomenon. Man indeed knows that he thinks; he has the consciousness that he knows. But this means either that he feels himself affected by the course of his thoughts, and can make the relations of these the objects of his consciousness, or that the knowledge of his thinking is not separate from the thinking itself. The very fact that the doubling

of knowledge (the knowledge that one knows) can be continued to infinity, shows that we are not dealing with a true process, because the goal that we aim to reach is the very starting-point on which we stood to begin with. The fact that we think, Kant teaches, is not an experience, but the condition under which all our experience is possible.¹

This pure or formal consciousness which is expressed by the word "I," and which rules all our ideas, includes as it were the whole content of our experience. In it both the antithetic directions of experience are united into one. The same connection which binds our feeling and our effort, our thought and our purposes, unites also the totality of our external experiences. It forms a single homogeneous consciousness which we can extend in thought beyond the present perception of physical nature, even beyond our own personal existence into the past and into the future. The unity and uniqueness of being, the proposition which Dühring places at the head of his schema of the world, is the result of the unity and uniqueness of the consciousness that thinks the world.

From a purely formal standpoint, consciousness is to be presupposed as everywhere identical, for the absolutely simple must be everywhere and always like itself and uniform with itself. So every mathematical point is necessarily identical with every other, so far as its concept is concerned—a statement which, I believe, contains more than a mere equation. Wherever the thought "I" arises, the same "I" thought must arise. The highest consciousness cannot differ from the lowest in this particular. The thought "I" is, at the same time, the most individual and the most general which we have. It binds together and mediates between the individual and particular, and the general. When we form the concept of a simple element, an atom, we place in thought the simple unity of our own *ego* at the basis of the idea of it. This

¹ Kant's *Werke* (Rosen.), xi. p. 262, ii. p. 276.

accounts for the inclination to transform the theory of atoms into a monadology. Farther, when we think anything in a way universally valid, or believe we do, we are conscious of thinking it as it is thought by every other *ego*. My *ego* takes the place of the "we," the individual the place of the universal "I." In the unity of our consciousness, we have the type and the presupposition of every empirical unity, whether it be the world or some single thing. So every particular form of experience, every law of phenomena, bears the stamp of the homogeneous nature of our own thought. Laws of nature, in the more exact meaning of the phrase, only exist for the mind which thinks nature. It is the mind which makes the constancy and uniformity of phenomena into universal premises, and so obtains the law as the conclusion of its syllogism—to speak of laws outside the mind, involves a logical anthropomorphism, which has no more foundation than the teleological.

Undoubtedly, the thought of nature as subject to law was suggested by observation, as it must be constantly confirmed anew by this same means. Without empirical regularity there could be no exact idea of the prevalence of law; without it the mind would remain, in Kant's language, a dead power unknown to itself. On the other hand, mere regularity does not suffice to give in its completeness the idea of the prevalence of law. This concept cannot be obtained simply by observing nature, for nature shows apparently irregular as well as regular sequences. Rather it is discovered by reflection on our own thought, and then transferred to nature. So in antiquity, what we call law, was designated as the *logos* of things. As the phenomena of nature were interpreted after the type of the will in the age of animism and mythology, so in the age of philosophy and science they are interpreted logically and mathematically, or, as we say, they are explained by laws. The objective element in a law is the general fact which forms its content; the subjective and

formal element, the meaning of this fact as a law for our inferences.

We discover only such laws in nature as we in a certain sense introduce into nature. In our scientific investigations we introduce the laws in the form of assumptions which are determined more exactly by phenomena, instead of deducing the laws directly from these, as would be the case if our procedure were purely empirical. Mere perception never shows us cases perfectly alike. We go over from sense experience to intellectual experience;— we make the cases alike in thought and by experiment in order to test the logical postulate that law controls every event.

The principle of the persistence of matter and of force, and the history of its discovery, suffice to show that the unifying form of our thought must be reflected in the fundamental principles of objective science, as well as in the general relations or laws of phenomena. Only because we know ourselves as the same *ego* in all the change of inner phenomena, is it possible for us to think matter and force as persistent in all the change of external processes, and each as one with itself. The principle of persistence has both an empirical and a general logical meaning, and in this latter meaning it was already known in antiquity as the axiom which stood at the beginning of all their study of nature. To-day also exact thinking cannot entirely dispense with the axiomatic part of the principle and be satisfied with the empirical proof, exact as the means of observation and measurement may have become. Experimental proof, without the connecting thought expressed by the axiom, would not be perfectly conclusive. If the chemist treats the H and O which he obtains by analysing water as the same H and O which previously entered into this synthesis, his conviction cannot rest upon the observed agreement of weights alone. His determinations of weight in the earlier and the later case are separated from each other in time, and

are so far different perceptions. Mere experience only teaches him that different perceptions agree, not that the objects themselves are identical; and his belief in this identity, which is expressed in the fundamental principle of the persistence of matter, thus cannot rest upon mere experience. Farther, how would it be possible to refute the assertion that the visible motion which disappears as such, is really destroyed, that the invisible motion which is felt as heat, arises out of nothing,—except that creation and annihilation are impossible; in other words, except that the necessity to think the real, taken as a whole, as persistent and one with itself, stands fast to begin with, and for all experience.

There is no absolute continuity of perceptions. From perception alone I can never know with certainty what phenomenon really has taken the place of another, and still less that, in spite of apparent differences, it is identical with this other; yet it is necessary to presuppose this as often as I assume a causal connection between phenomena. Every perception is isolated from every other in time, and so far it forms a new self-existent fact. The continuous connection between phenomena, their relation to one and the same object, these cannot be perceived. They must originate in the unity of thought—the fundamental presupposition for experience and for science, and for this very reason one of the limits of investigation.

CHAPTER III.

THE ORIGIN AND THE CONCEPT OF EXPERIENCE.

§ 1. EMPIRICISM and nativism are two opposite theories as to the origin of experience, which have only been reconciled by the present psychology, based on the theory of development. The same claim is justified so far as the activities of sense and their adaptation to the relations of external phenomena are concerned. What used to be explained by innate conceptions or through the assumption of unconscious inferences, can now be understood as the result of adaptation and selection, of inheritance and development. The power to use senses intelligently is undoubtedly born in the individual. Individual experience and practice can indeed increase this faculty and develop it farther, but cannot create it. The correspondence of points in the retina, the accommodation of the lens to different distances, the convergence of the axes of the eyes, these are qualities and faculties of the eye which do not stand under the direct control of the will. From this we infer that they could not have been originally acquired by acts of the will. The assertion of the opposite makes it necessary to call in some unknown power of consciousness. Hering teaches that there is an innate, functional relation between corresponding points of the retina, which, as is shown by the partial crossing of the fibres of the *opticus* in the chiasma and the occurrence of corresponding paralysis of the retina, rests on an anatomical foundation.¹ Physiology recognises this co-activity of the two eyes; this is evident from the

¹ Hermann, *Handbuch der Physiologie*, II. i. p. 365.

fact that it explains the perceptions of vision by starting from the one double eye. The assumption that the correspondence of the retina-points, the position of the axes of vision, the measurement of the field of vision, are acquired in individual experience with the help of unconscious inferences, attributes to the unconscious powers of the mind, the existence of which is more than doubtful, what the conscious powers are entirely unable to accomplish. The innate origin of the causal principle is no longer necessary to explain perceptions of sense, since Darwin discovered a principle of mechanical adaptation, the principle of selection in the struggle for existence. Instead of deriving the wonderful faculties of the eye from individual experience, or explaining it by the summation of experiences of all the individual's ancestors, we can ascribe it without hesitation to natural selection. The development of the functions of sense until they are completely adapted to the needs and the external relations of a living being, has such a decisive importance for his preservation, that it must be under the constant and most exact control of a selection which accurately preserves the smallest advantageous change, and the accumulative effect of which infinitely exceeds what can be accomplished by purpose and experience. It may be said of certain phenomena in nature, including the functions of our senses, that they are too wise to be intelligent, and so must be mechanical.

The apparent defects in the activities of sense can also be understood on the supposition that they had a mechanical origin. The perfectness of the organs of sense, and of their functions as the result of adaptation, is limited by the animal's mode of life. It is not an absolute or abstract perfectness, but only relative and concrete; and if the eye, as Helmholtz shows, is anything but a perfect optical instrument, we have to remember that it was not planned as such, and also that it is something far more than an instrument, namely, a

living organ which has to perform all the functions of such an organ, growth, nourishment, preservation. Mechanical adaptation explains farther the occurrence of so-called sense-deceptions. If sense-deceptions really were unconscious inferences from the majority of cases to the exceptional case, for which we presuppose the customary position of the organ (which, however, we do not notice in perception itself), and the regular causes (which are only discovered by the comparison of perceptions), then it must be possible to set them aside or at least to modify them by correct inferences. It is the universal experience that the mind's correct knowledge remains without influence on them, and this must be the case if they are the result of mechanical rather than psychical adaptation; for mechanical adaptation must give the preference to a definite position of the organ, the normal position, and can extend only to the regular relations of the external world.

The processes of perception may indeed be thrown into the form of causal inferences, as Helmholtz has shown. And we use this form when we are communicating results, or wish to prove the validity of results in particular cases. But this is no basis for the inference that the perceptions themselves are obtained by such inferences, or even (taking into account heredity) were originally acquired in this way. Agreement in results is no proof that the processes are identical. As we may describe the processes of perception as causal inferences, so we can describe all the results of adaptation in nature as teleological. But no one believes to-day that this alone is sufficient reason for inferring the real existence of purpose and ends in nature. The same argument which is universally used to-day against the assumption of ends in the external world, holds good against the assumption of unconscious inferences. If it were permissible to draw the general conclusion, that everything which we can analyse in determinations of thought,

must have arisen originally from thought, then one might finally assert that all the processes of nature are the results of a process of thought. In particular he might prove from the mechanism of these processes a physical or objectified logic, which would only be a pure analogy, a metaphorical expression; just as surely as if the process were reversed and the logic were explained as a mechanics made subjective.

The nativism which we have to assume on the basis of the theory of development, is a physiological, not a psychological nativism. The adaptation of the individual's sense to the external world precedes his experience, so important is this adaptation in relation to the needs of life.

§ 2. This removes the principal difficulty in the way of psychological empiricism: the explanation of perception from individual experience. We cannot, however, draw the immediate conclusion that this theory is correct in its other points, little as we may want to assert that its opposite, psychological nativism, is exclusively correct.

It was not Locke, as is generally assumed, but Condillac, who first taught a purely empirical theory of the origin of conceptions, for he regarded conceptions as nothing but transformed sensations. Similarly, it was not Descartes, still less Kant, but Leibnitz, who taught a thoroughgoing nativism, or more exactly a spontaneous evolutionism. According to Leibnitz all concepts, even the empirical, proceed from the activity of the spirit alone, from its innate mental power. This theory is only the result of his fundamental metaphysical position, according to which he treats force as the essence of substance, and self-development as the activity of force, and finds impossible any real interaction between substances as well as any real affection of the senses by impressions.

Since there are concepts for which no prototype can be found in sense experience, there must be innate powers of

the mind. Else where could those concepts have arisen? In this sense Descartes taught innate ideas, without, however, understanding this expression in its literal meaning. Only the mind's power to arrive at certain concepts independently of external experience, and yet without arbitrariness, must, in his estimation, be regarded as innate. Descartes compares this innate capacity with the inherited tendency to develop certain moral qualities, and the disposition to some particular physical characteristic, *e.g.*, a certain disease, thus making it parallel with physiological heredity. To confirm his natavistic theory, he points to the mathematical, especially the geometrical, concepts; and Locke also, in order to explain these concepts, finds it necessary to assume certain processes of the mind, by which the simple sense-ideas of extension and duration are modified. So the antithesis between Descartes and Locke does not concern the general assertion or denial of innate powers of the mind, but only the kind of powers that are innate and the extent to which this is the case. While the mind possesses a certain constitution, according to Descartes, which can be compared with the inherited constitution of the body, and from which definite concepts proceed with inner necessity and without aid from external experience; according to Locke, it has the general capacity to acquire concepts, but no particular direction of this capacity, which direction is given by impressions of external and internal sense.

In rejecting innate ideas, Kant agrees with Locke, but in distinction from Locke he seeks to reduce to its correct degree the value attached to the sense-factors of knowledge: sensation and empirical intuition. Without assuming, as Leibnitz does, that the content also of concepts arises from the self-activity of the mind, he teaches that the form of every concept, the unity of its manifold, cannot be given by impressions, but must be thought by the mind. And when he draws from this the conclusion that

pure concepts arise by reflection on this activity of the mind, he limits this conclusion by the remark that such concepts taken by themselves do not give any knowledge. Without intuition they are empty, mere forms of thought, as intuitions without them are blind; *i.e.*, they are not connected into the unity of consciousness. Experience is the product of mind multiplied by sense; the activity of the mind is a source of experience just as original, just as indispensable, as the receptivity of sense.

The truth of this theory, by which it unites the one-sided standpoints of Locke's empiricism and Leibnitz's evolutionism and rises above both, lies in its recognition of an active side of consciousness as well as a passive; in Kant's words, it lies in the recognised connection of the spontaneity of the mind with the receptivity of the spirit. The affection of sense and the function of thought work together in all knowledge. Neither do impressions of sense precede the concepts of the understanding as Locke teaches, nor are concepts created without real affection of sense, as Leibnitz asserts.

This theory, which denies the purely empirical theory of the origin of concepts, cannot, however, be called natavistic. It does not lay weight on the fact that the spontaneity of the mind is innate in the individual, but on the fact that spontaneity is as essential to consciousness as receptivity; in other words, that it is just as essential for it to react to impressions as to receive impressions. It follows from this, however, that an act of consciousness must already be included in sensation, that sensation is not purely passive, that it cannot be the absolutely given material of knowledge, as even Kant seems to regard it.

Pure empiricism, alike whether it regards the concepts as won anew in every individual life, or, according to the theory of development, as born in the individual to-day, is a hypothesis which is not confirmed either by the psychology or the physiology of knowledge. The former

distinguishes an active and a passive side of consciousness; and the latter recognises the motor functions of the cerebro-spinal system in addition to and in connection with the sensory functions. Each science expresses the same fact from its own side. The first sensation experienced by a living being, as well as every sensation felt later, presupposes the activity of consciousness in addition to its sensitiveness to stimuli.

§ 3. After establishing the position which we have taken, on the question as to the origin of ideas, we proceed to test a widely extended and respected theory of sense perception. Later, a distinction must be introduced between mere perception and experience, from which it will be evident that only man can have an experience in the proper sense of the word, *i.e.*, the knowledge of objects by perceptions, in which perceptions are apprehended as phenomena of objects.

The hypothesis of an inference from effect to cause is declared unavoidable in explaining the perception of the external world, and the projection of sensations, their (assumed) transposition into space. Schopenhauer and Helmholtz regard the necessity of making this assumption, as at the same time the proof that causality is an innate function of the understanding. The latter is incorrect in attributing this view to Kant. In the first place, there is a distinction between innate and *a priori*. Kant rejects innate ideas, and the element of causality which he regards as innate, or rather as peculiar to the mind, is not the concept itself, but only the capacity to put this concept (which, as Hume has shown, does not lie in sense phenomena) at the foundation of its judgment of these phenomena. According to Kant, intuitions of sense do not take place without the functions of thought as well, and it is from one of these functions, in its application to phenomena, that the concept of causality arises, as a law, not of perception, but of experience. Secondly, Kant in the paralogisms directly combats the hypothesis

that external perception first arises by a conclusion from effect to cause, and shows that it is as immediate as internal perception.

When the mind in virtue of its innate function of causality relates the sensation to its cause, according to Schopenhauer's Berkeleyan standpoint, it creates its objects; while according to Helmholtz it only recognises them by unconscious inferences. Both thinkers agree in the view that sensations themselves are given as something purely subjective, so that it requires a particular act of the mind to transform them into elements for objective intuition. In the opinion of the philosopher sensation is such a stupid, poor, one-sided thing that it cannot be the immediate source of intuition. It is known to us originally, the physiologist teaches, only as a stimulation of the nerves; and yet Schopenhauer, in his theory of sense knowledge (deserving of closest attention, although it starts from a false fundamental assumption) shows in great detail how the mind uses "all, even the minutest data" which it gets from sense, in building up intuition! - Sensation can hardly be so one-sided and poor as Schopenhauer has regarded it. As for the assertion of the physiologist, it is impossible to understand this as meaning that we are conscious of sensations originally as stimulations of our nerves, since we possess no innate knowledge of the nerves and the brain. Evidently a result of scientific reflection is transferred to the process of sensation itself. Even the physiologist does not know sensations immediately as stimulations of nerves, they are given for him as elements of perception; and it is only by perceptions, *i.e.*, on the basis of sensations, that he arrives at the knowledge of the existence of nerves.

I must dispute the assumption that sensations are originally purely subjective, for it expresses, I believe, almost the opposite of the truth. If sensations come into consciousness as something which belongs exclusively to the subject, the concept of something objective must be

present at the same time with it, for one can only become conscious of anything purely subjective by bringing it into antithesis with something objective. Is it natural that a distinction relatively so fine, and not rather the absence of the capacity to make such a distinction, should characterise the earliest state of sense consciousness?

If we observe the behaviour of new-born animals, they betray nothing of the fact that they are conscious of their sensations primarily as subjective stimulations. We are rather inclined to explain the wonderful accuracy with which they realise sensations, and which is an effect of adaptation and heredity, as an inborn intuition. Nor does the way new-born babes react to stimuli of sense, compel us to assume that the earliest sensations of man are purely subjective. With sensation is associated the impulse to motion, by which new sensations are obtained. A constant group of sensations which is connected with every motion, and is characterised by its own emotional state, must gradually distinguish itself for the child's consciousness from the totality of the remaining, more or less changing, groups. From the double feeling in touching parts of its own body as contrasted with the simple feeling in touching a foreign body, from the active feeling which accompanies the self-motion of its own limbs, as contrasted with the passive feeling of being moved,—from these the child learns to distinguish its own body from the rest of the external world. At the very time when, according to Schopenhauer, it should gain wisdom with the help of an unconscious concept of causality, it has attained this goal without that help by purely conscious perception. Instead of starting with an original pure subjectivity of sensation which does not exist, and seeking for an explanation how it can acquire objective meaning, one should begin with the objectivity which sensation possesses for sense knowledge, and show how it can assume for reflective knowledge its meaning as the effect of an object, how it can exchange immediate for mediate subjectivity.

By "eccentric" sensation is meant the fact that we do not perceive the sensation at the point where it arises. The images of vision appear to us outside the eye and entirely separated from the body, while the sensations of touch, although they arise in the brain, are perceived at the periphery of the body.¹ Besides this localisation of sensations, still farther changes seem to have taken place in the impressions of vision before they come to intuition. The impression received as twofold is generally felt as simple, the reversed image on the retina is always seen as upright; but when we have no direct experience of these changes in our impressions, then indeed the unconscious inferences seem necessary to help us out; unless we except Sergi's theory of a recurring nerve stream, the "perception-wave."²

Can sensations be projected at all, can they be dislocated and moved about like physical things? In particular, can the spatial sensations of vision and touch be separated from the space perception itself, so as to justify the question, as to the way in which they come into connection with this perception, the way in which they come into space? Is the so-called projection really the expression of a fact which we have to explain, or simply the conclusion which is drawn from a fact and may be false? So the feeling of a pain may be apparently projected. It is merged with the idea of a part of the body into a unified consciousness, and so receives a spatial determination. And yet feeling, as an absolutely non-spatial state, cannot be anywhere in space, or have

¹ When we touch an object with a stick, we get two sensations of touch, only one of which remains connected with the body, while the other is projected to the end of the stick.

² For the explanation of the perceptions of vision, especially the so-called deceptions of vision, Alhazen, long before Schopenhauer and Helmholtz, assumed sense inferences, which he compared with logical syllogisms. He believed that these were applied immediately in perception, i.e., without any consciousness that we are drawing an inference. Perhaps the hypothesis of unconscious inferences may be traced even farther back to Ptolemaeus, whose optics Alhazen worked over, and to the Stoic theory of knowledge.

a position in it; strictly speaking, it cannot be projected into space.

Our perceptions of vision are simply there where they appear, and in the state and form in which they appear. The place of the direct sensation cannot be separated from the place of their perception, any more than the visual perception can be separated from the perception of the external world, and the latter inferred from the former. Intuitions of sense are themselves the immediate objects of our knowledge; sense consciousness knows no other objects but these.

If both the retina images were the immediate objects of our intuition, as is usually thought, a series of farther processes would be necessary in order to arrive at the perception of the external world by vision. For the man who sees, those images are not real but virtual. He knows that they would arise from optical causes if he could see his own retina, *i.e.*, could make it the object of his sense of vision. As real images he does not perceive them in his own eye, he sees them as such only under particular conditions and in the eye of another. The optical stimuli which he feels, are not in themselves images: they are only transformed into images by the act of vision. Images are the results of seeing, not the sense basis of seeing. Briefly images exist on the retina only for him who sees the retina of another's eye, or thinks the retina of his own eye, the organ of seeing, as itself the object of vision. Among the *Hyperidæ* the convexity of the cornea is lacking, and with it the image; and yet Grenacher asserts, in his investigations of the *Arthropod* eye, that no one who has seen the structure of the eye, and has observed the habits of the living animal, can regard it as blind or having poor vision.

Since we cannot see our retina or the images on it, but can only get sensations and so perception by stimulations of the retina, the matter of simple vision and the

so-called reversal of the images ceases to be a problem. What is felt as double will be seen as double,—as the possibility of double images shows. But that the stimulation of corresponding points gives only one sensation, may be shown both from anatomical causes in the relations of the conducting fibres of the *opticus*, and more especially from a general psychological reason. Consciousness in virtue of the unity essential to it, can only perceive two impressions exactly alike and simultaneous as one sensation. Impressions may be intensified by being doubled, but while they are alike and simultaneous, they cannot separate into two sensations. Farther, the mind, as Romanes well says, is no perpendicular object which stands upright behind the retina, as a photographer behind his camera; it does not perceive the impressions of vision in the position and relative place which they would assume in the virtual retina images, but in the position and place which things assume in relation to the retina, and which is recognised by the sensations of touch.¹ As a moving organ, the eye is to be regarded as an organ of touch which, in a certain degree, has the capacity to perceive change in the place and direction of images, so that the arrangement of objects in the common space of perception is made easier by the nature of the organs.

What is called the projection of images is really the association of images with the simultaneous sensations of touch. To relate a perception of vision with an object is simply to relate it with a simultaneous, real, or possible sensation of touch; and when the perceptions of vision seem to be separated from the body while the perceptions of touch remain connected with the body, this appearance is explained by the fact that in seeing we do not feel in any marked degree the share of the eye in this, as we feel the hand when it touches an object. Because we do not feel the body in the act of seeing, we perceive the

¹ Romanes, "Mental Evolution in Animals," London, 1883, p. 85.

images of vision without any accompanying sensation of the body. This relative freedom from feelings alone lends to the intuitions of vision their character of pure objectivity in contrast with the perceptions of the other senses; at the same time, these intuitions of vision acquire a certain ideality, such that the sense of vision alone does not convince us of the reality of an object.

With the immediate perception which is there, where it appears, and so does not need to be projected, are associated ideas of the processes which lead to the dissolution of sensations, and the origination of perceptions. To these processes we refer certain places in the contexture of our total spatial experience, which consists partly of perceptions, partly of ideas. We project them into the brain, and science undertakes the task of defining their position more exactly.¹ While perception only knows the one place of images, the place where they appear, scientific experience knows also the place of those processes, the results of which come into our perception. And when we bring into experience the fact that the place and form of images do not necessarily coincide with the spatial relations of the partly perceived, partly thought objects, we also distinguish the perceived place of things from their real place and their real spatial relations. We connect these ideas with the direct perception itself. We add to the space which we perceive, a space which we think as perceived, and this space existing in our thought, we call the true, or indeed, the real space. Yet this cannot be understood as meaning that the true space exists in itself, independently of all relation to the perceiving act of our spatial sense. We only call it real space, because by means of our idea of it we connect all our external experiences, homogeneously,

¹ The part of the brain which has relatively the most to do with the sense of vision, for example, is, according to Exner (*Untersuchungen über die Localisation der Functionen der Grosshirnrinde des Menschen*. Wien, 1881), to be sought in the occipital lobes, while the investigator named believes that no absolute area can be marked out as peculiar to this sense.

i.e., bring them into agreement. The positions and relations in this space belong to the phenomenal appearance of the thing, for sense consciousness, just as much as do the positions and spatial relations in direct perception itself. Only the latter, in distinction from the former, constitute the phenomenal appearance which agrees with the totality of our external experiences. So the true form and size of the sun is that form and size which we deduce from our whole knowledge, and not simply from the immediate intuition of this heavenly body; it is not any form and size "in itself," for of this we cannot have the least conception.

In this true or real space, the idea of which fills out direct perception, the physiological processes of perception are themselves projected. In our thought we make the brain and the processes in it objects of a possible intuition, which we project into space, and which we put at the basis of the totality of external experiences. We think ourselves as, at the same time, perceiving the things and observing the process of our perception. It is clear that for our own consciousness, which is occupied with the act of intuition, the place where the perception originates can never be a real place given in intuition, but only a thought place, *i.e.*, a place represented as given in intuition. Only a second consciousness could observe this place, on the supposition that it could observe another brain in the act of intuition. Not perceptions themselves, but only the ideas we form of the process by which they arise, are projected; they are transposed as possible intuitions into the space which we add in thought to the real intuitions. A projection does indeed take place, but the process is the opposite of that suggested by this theory. It happens not unconsciously, but consciously. It does not precede perception as its condition, but is an inference from perception. We only need to be on our guard against confusing the body and brain "in themselves" with the real or possible phenomenon of the body and brain, in order

to be convinced that perception itself is not projected, and cannot be projected.

§ 4. Accordingly, it needs no inference from the effect in us to the cause outside us, in order to go from sensations to the intuition of the external world. External perception is as immediate as self-perception, and is given at the same time with this. The "I" can only have the consciousness of its existence when it feels itself affected by something, the existence of which it feels at the same time with its own existence. Subject and object are not only correlative in conception, they belong together also in sensation and perception, and while they can be distinguished they cannot be separated.

A sensation which did not occasion a stimulus to motion, or to some external effect, would be useless for any living being. It cannot, therefore, be developed according to the principles of the theory of development. So every sensation in itself is related to something external, independent of the living being. Even the simplest consciousness can distinguish the feeling of limitation which stands in the way of its active effort toward the outside, from the feelings which reflect the states of its own body. Rhizopods (according to Engelmann's observation), draw together their varying pseudopodia which serve both as organs of touch and of motion, as often as they come in contact with any foreign object, even though it be only the pseudopodia of another individual of the same sort, while there is ordinarily no contraction when the pseudopodia of the same creature touch each other. So even these lower animals which certainly have no innate idea of causality, and apparently no clear consciousness of space, are able to feel the external world.

In fact the conviction that something different from us exists outside us, does not come from thought; it proceeds from sensation, *i.e.*, it rests on the same foundation as the conviction of our own existence. Certainly the relating of sensation and intuition to something real

which we feel, to something which we know produces an effect on us, is an act of consciousness; and in so far all intuition, and sensation as well, is intellectual. However, this act cannot be separated from the consciousness of sensation itself. Sensation and perception have real meaning immediately and in themselves. This applies even to hallucinations, for one cannot even form an hallucination without a body and without perceived changes in the state of the body. The content of these illusive ideas, as well as of dreams, consists of real, though abnormally stimulated sensations. It is impossible to imagine that one has a sensation.

§ 5. Perception and experience are not identical in meaning. Experience is far more than even the result of repeated and interconnected perceptions.

If the language of ordinary intercourse is used in science, it is often impossible to avoid apparent contradictions. Experience, Kant teaches, gives to its judgments no true universality, but only apparent or assumed universality; and its necessity is nothing but the subjective necessity which springs from the habit of expecting cases like those that have preceded. On the other hand, the fundamental principles on which experience rests are purely synthetic principles *a priori*, which as such are valid and necessary; it is possible only through the idea of a necessary connection of perceptions. These "must first be subsumed under pure concepts of the understanding before they can serve as judgments of experience, in which the synthetic unity of perceptions is thought as necessary and universally valid." Who does not see, even though Kant thought it unnecessary to say so expressly, that in these phrases experience is used in a double meaning; the popular meaning, according to which it coincides with mere perception, and a more exact meaning according to which it is equivalent to knowledge? The experience with which, as Kant says, all our knowledge undoubtedly

begins, cannot be the same experience with which it ends, the possibility of which, as he teaches, is the principle of every objectively valid synthesis through concepts. Experience in this second, more exact meaning of the term, is not the means nor the mere material, but the "goal of knowledge of the objects of sense;" and the methods of science have no other task, nor can there be any higher task for them, than that of making experience complete. Every perception and every rule obtained by comparing perceptions, is, according to this exact concept of experience, to be thought as originally brought into a universally valid, law-controlled connection, whether we recognise this connection in the particular case or not.

To have experience of anything, or, to use Kant's expression, to make an experience of anything, means to know it in a way universally valid, *i.e.*, as it would be known under like conditions by every similar consciousness. Experience is not the relating of an intuition to its object; it is this relating in a manner universally valid.

When I think something as an object of experience, I connect with my perception the idea that this perception is valid, not merely for me in the momentary state of my senses, but always under like circumstances for me, and for every like consciousness. I regard something as object of my experience when I presuppose that it is independent of my perception as such. The object is not given to me as outside my perception; hence I can only express its independence of myself by making my perception of it universally valid, *i.e.*, by relating this perception to a common consciousness. I think it as taking place under like circumstances always and for every one in similar manner. Even hallucinations and dream images, to which no common object corresponds, and which are so far subjective, acquire objective meaning; they come into connection with universal experience, if we presuppose that

they are necessary, *i.e.*, that under exactly the same circumstances they occur always in the same way, although this combination of conditions may never be repeated a second time in exactly the same manner.

So everything in experience, every single phenomenon and every rule governing the connection of phenomena, is universally valid in virtue of the relation of perception to a common consciousness; and although for empirical knowledge there exist differences of greater or less universality, in so far as one part of knowledge may be subordinate to another in a scientific system, still with reference to the universality essential to the whole of experience as such, there is no difference between an individual fact and a rule drawn from such facts.

§ 6. Before the desire to communicate perceptions and the ideas based on them is awakened, there exists only an individual intuition and an indefinite object of intuition felt by a consciousness just as exclusively individual. That desire is first awakened by life in society, it is a result of the social impulses that have been acquired and established in the struggle for existence. Only animals that live in society break through the circle of the individual consciousness, they extend this by their psychical relations with their companions until it becomes a social consciousness. This first prepares the basis for experience proper, the common knowledge of common objects. The simple fact of social life is not sufficient to make experience. In addition the consciousness of rules must be present, to which thought in the community is subject; and this, so far as we know, does not exist among any animals. Where the consciousness that an intuition is universal, is lacking, it is not yet possible to speak of experience proper. So children in the first stage of their psychical development have no experience. We do not indeed know how early the influence of thought-intercourse begins to make itself felt on the child's consciousness, for we do not know how far this influence is reinforced and

hastened by heredity. I am inclined to believe that with every perception by man is associated the impulse to communicate it.

Experience is a social concept, not a concept of individual psychology.¹

Experience which originated and is constantly originating anew in the effort to communicate ideas, as the product of common or inter-subjective thinking, necessarily stands under the laws which control this thinking. It stands under logical, not under psychological categories. While the latter serve to connect perceptions with the individual self-consciousness, and so may be immediately abstracted from intuition, the former are the laws and standpoints which regulate thought-intercourse, produce agreement in the thinking of individual subjects, and so produce a common consciousness among them. If the perceptions are connected with this consciousness, if they are thought as objects of this consciousness, from this connection there arises experience as the universally valid knowledge of the perceived content. The consciousness of the unifying concepts of universal thought must in some degree be developed, if experience is to be possible in distinction from mere perception.

In experience perceptions cease to be regarded as themselves things, as is the case for immediate intuition; they become phenomena of things, the distinction between perception and object is drawn by relating the former to an object in general, *i.e.*, by making it independent of the individual consciousness. The indefinite felt object of immediate perception, the something to which the sensation is related, becomes in experience a definite

¹ Even Kant distinguished between judgments of perception and judgments of experience, and regarded the consciousness of universality as the decisive characteristic of the latter. But inasmuch as he treats the judgments of perception as making use of the same categories hypothetically, which are used categorically in the judgments of experience, the distinction between the two is again destroyed or made unintelligible. Yet in the concept of the objective transcendental unity of consciousness, Kant discovered the concept of a common consciousness, and so pointed out the social factor of experience.

conceptual object. And since the perceptions, in so far as they are to be factors of experience, are subject to the condition of the communicability of ideas, the only objective element in them is the conceptual or formal, that which through them is known of things outside ourselves, *i.e.*, the definite relations of simultaneity and succession, of place, form, and size. In these relations we may know the pure object of external experience.

§ 7. The above distinction between psychological and logical categories must be developed more fully in the case of the two typical examples. If I understand causality to mean the feeling that one phenomenon depends upon another, and the impulse to complete for imaginative thought the perceived change of my state, then causality is a psychological concept. On the other hand, the concept of the reason of change on which depend knowledge and the proof of a causal connection, is a logical concept. It gives to a series of phenomena which I perceive, the meaning of a law for perception in general. The possibility of experience and the progress of knowledge rests on the supplanting of causes by reasons. So mechanics does not seek the cause of an acceleration, but the quantitatively determined reason of this; and if J. R. Mayer had speculated in concepts of sensation about the meaning of force, instead of directing his attention to the reasons of its phenomenal appearance, he certainly would not have succeeded in discovering the principle of the persistence of force. The concept of a thing, which has the concept of the attributes of this as its correlate, is a psychological form of apprehension, which is applied immediately in the intuition itself. That which is represented as a whole by reason of its spatial limitation and its motion *en masse*, is regarded in intuition as a thing. The inner phenomenon does not indeed give this concept, and yet there appears in it a constant group of feelings as the empirical ego over against the changing states of consciousness. Again the concept of

substance is a logical category. The possibility of a judgment rests immediately on the constancy of the subject. I cannot judge if the subject of my judgment is constantly changing unless it be that this very change of the subject is the subject of my judgment, in which case in order to be able to think this change, the idea of something persistent must still be laid at its foundation. I cannot know that my judgment in a given case coincides with the judgments of every one else, unless I know that all these judgments are related to one and the same subject. This logical necessity as applied to perception becomes the concept of substance. The persistent in the phenomenon which is thought as the subject of judgments of experience, is the substance in the phenomenon. And because only that part of external experience which remains the same in quantity, can be proved to be persistent, matter and force are the substance of external experience; while for inner experience there is given only a substance for thought, not a substance for intuition, in the simple self-consistent form of the ego.

§ 8. Although the logical principles first come to consciousness in thought-intercourse, they are not created by this. They are not invented by it, but discovered. In this sense they precede experience, not chronologically, but logically. They are the *a priori* of experience; its basis, not a result of it.

If I begin with the psychological origin of experience, I find first the impressions of sense, by which my consciousness feels itself affected, and which thus are related to something which is independent of my own existence. Since the connection and succession of definite impressions are governed by law, since they contain an empirically universal element, I reach through them a practical experience, which arises from the expectation of definite results from definite impressions, and becomes the practical guide of my actions. But, at the same time, I stand in thought-intercourse with other subjects. And as I unite

my effort and purpose with the effort and purpose of the community, I connect my perception with the idea of a common consciousness, and thereby I think the objective element in it as object (universally valid) of experience. Accordingly, the conditions under which my thought-intercourse with others stands, and under which alone a universal consciousness proceeding from this is possible, are, at the same time, the conditions under which the objects of experience must stand; because the concept of such an object first arises by relating it to that universal consciousness of a perception, which, taken by itself, is always individual.

§ 9. The logical conditions of experience, the categories of the persistence of substance, of causality, or the sufficient reason of experience, of the interrelation of phenomena in a single all-embracing reality or nature, are not, as Kant teaches, given as a multiplicity of non-homogeneous concepts, as an arrangement of the understanding which exists simply as a matter of fact. They proceed from a single highest principle, the principle of the unity and persistence of consciousness, and are distinguished only by the application of this principle to the universal relations of intuition. The "I," the thought of which stands for the general in the individual consciousness, becomes conscious of its unity and self-identity as the condition of all knowledge, either in the analysis of a simultaneous manifold of impressions of which the intuition-form is space, or in the connection of a series of impressions, or in the combined acts of analysis and synthesis, from which arises the concept of a totality of related phenomena. By means of the first the persistent is distinguished from the changeable; by the second, change is connected with its reason; finally, by the third, all that is real, processes and things, are thought as belonging to one and the same world, each single portion as part of the whole of nature. This third and broadest unifying concept of thought, which may be described objectively as the principle of the

identity of reality with itself, as the unity and uniqueness of being, contains both the former concepts as moments in itself. It can be, as it were, analysed into two components, one of which consists in the application of this unifying function of thought to the simultaneity, the second, of its application to the sequence of phenomena.¹

§ 10. Experience stands under the law of the unity of thought as its most fundamental principle. Perception and concept work together to produce it, experience obtains its *reality* through that in it which belongs to sensation and perception; and *objectivity* through the conceptual element in it, through the relating of the perceptions to a general consciousness. So in idea experience and science (if the latter means real science and not formal logic and mathematics) are not different. Experience is the beginning of science, science is the completion of experience. Science develops what before

¹ Kant distinguishes the schema of the category from the category itself, because he separates thinking and perception, and introduces pure forms of intuition between the two. In order to make sure that the categories apply to phenomena, it is not necessary, however, to take refuge in such an artificial theory as the Kantian schematism. Rather category and schema mean the same thing. A category not schematised is an uncompleted thought. As means of schematisation, Kant applies exclusively the universal form of intuition, time. There is no reason why space might not serve equally well. Certainly the categories of substance and reciprocity cannot be schematised without the space idea, the form in which we perceive simultaneity. Accordingly we possess no schematised idea of the *ego*, i.e., no idea of it connected with possible intuition except with reference to its persistence.

In truth, however, we do not need pure forms of intuition in order to apply the unifying concepts of thought in and for experience. The qualities of space and time, the unity, continuity, and infinity which Kant used to prove the *a priori* character of these ideas in order to draw the unavoidable conclusion that space and time must be mere forms of intuition, are already (as attributes common to both forms) logical determinations of space and time, and that, too, of empirical space and empirical time. We think of space and time also as homogeneous, or similar in character throughout, because we can abstract in thought from every perceived difference in the content of time and space. We think them as infinite because we can continue the perceived space and time in thought without hindrance. In spite of their infiniteness we ascribe to them unity, because for our thought unity with itself is essential to synthesis and analysis. Kant's pure forms of intuition are, in reality, only conceived empirical forms of intuition, and the unifying concepts of thought do not need the interposition of ideas (which, like Kant's pure intuitions, are neither intuitions nor concepts), before they can be applied to phenomena.

has been outlined for knowledge by the concept of possible experience.

Although we presuppose the principles of experience in general, in order to prove them in particular by the actual connection of phenomena, this process is not to be regarded as arguing in a circle. No one thinks it is arguing in a circle when physics first solves a problem analytically, in order to apply this solution to real relations by introducing empirical constants, and so to prove its correctness by experimental verification. Universally in science, principles are introduced to explain phenomena, and are proved to be real through the phenomena themselves. We use the same process in philosophy, the science of experience in general, when we start with the analysis of possible knowledge, in order to transform this into real knowledge by actual experience which we produce. That this process is applicable, that external nature can be known according to the principles of possible experience, proves that consciousness and the external world belong to one and the same reality, that they are, so to speak, "of one mind." The phenomenon of nature, moreover (and with this alone we have to do in experience), falls within consciousness, and so is necessarily subject to the laws of its unity.

Rationalism and sensationism, the two opposite theories of the meaning of knowledge, must therefore be connected with each other, as are nativism and empiricism, the two theories of the origin of knowledge. In the relation of perceptions to a common consciousness, and in the subjection of perception to the conditions of universality, all experience necessarily has a rational element. A purely psychological analysis and empirical deduction of this concept can never be sufficient, for experience springs from common thought, and is related to common thought.

EXPLANATORY NOTE.—When I think two phenomena as causally connected, by this thought I make their relation an object of experience. The proof that in the given case such a connection really exists, is obtained by

the reciprocally quantitative determination of the phenomena. But without those thoughts I could not seek this proof, nor could I understand it even if it were given me from some other source. Experience cannot be given to me ; I must make it by subsuming my perceptions under the conditions of their universality, the conditions of possible knowledge, which must be known to me beforehand. The universality of a perception is the condition under which alone it can be an element of experience. A perception is universally valid when and in so far as it is subject to law, when under the same conditions, objective as well as subjective, only one and the same definite perception is at all times possible. The thought that perceptions are subject to law is, therefore, an *à priori* condition of experience ; through this alone is it possible to recognise and to establish the fact that a perception really belongs to experience, i.e., to the universally valid knowledge of a common object, and is not merely the consciousness of the subjective affection of one's own sense.

CHAPTER IV.

DARWINISM AND TRANSCENDENTAL PHILOSOPHY.

§ 1. UNDOUBTEDLY it is a correct and economical maxim of investigation to apply a principle, which has already proved useful in wide spheres of knowledge, to still other spheres, in order to test its full reach or to avoid the introduction of a new principle. It is, however, necessary to be on one's guard against carrying this maxim too far. The principle should not be carried over to phenomena which by their very nature cannot be subject to it.

Since biology and psychology, the study of organic and the study of psychical nature stand in such close relation, since such marked parallels exist in general between the development and differentiation of the nervous system and the unfolding and intensification of consciousness, one can understand the attempt simply to carry over the laws of organic development to the explanation of psychical development. Absurd as the attempt seems, it promises to shed light on some difficult questions of comparative psychology, in particular the question as to the origin and development of the instincts,—and it is only necessary to read certain chapters of Romanes' "Mental Evolution in Animals" (London, 1883), in order to be convinced of the fruitfulness of the method.

We know that even in individual life actions, the performance of which originally demanded a series of acts of will, can become automatic, i.e., independent of direction by purpose and consciousness. If such ordinary or habitual modes of action by the individual are inherited, and are taken up into the process of natural selection,

then in the course of the history of the race they must assume the abbreviated form of instincts. Numerous actions from instinct or impulse among animals may be explained by the disappearance of intelligence from actions originally conscious, on the supposition that characteristics first acquired in the individual's life are inherited. Many of the most striking and most beautiful adaptations to the relations of life would thus be finally attained by the gradual summation of a very great number of conscious actions. In this manner it is possible to explain, *e.g.*, the innate power of the chicken just out of the egg to set itself right in the external world, to perceive distances and to estimate them correctly; and still it is difficult to see of what use for the chicken's progress every single little step toward the gradual acquirement of this faculty could have been. In the case of single individuals, non-intelligent as well as intelligent habits appear which have nothing to do with adaptation. If these, as is assumed, are inherited and gradually changed, they cannot have been brought into an advantageous direction and established there by natural selection, as the intelligent habits are. This explanation is necessarily impossible in the case of a number of other instincts, including some even of the most perfect, such as the instincts of non-sexual and unfruitful insects. As Darwin shows, these instincts can only be attained and developed by natural selection. However attractive may be the explanation of certain instincts by the inheritance of intelligent actions, or even of actions that are not intelligent but have only accidentally become useful, difficulties stand in the way of an actual transfer by inheritance of individually acquired characteristics and faculties, as Weismann has pointed out in his important lecture on heredity.¹ Weismann shows that no proof has yet been furnished that acquired characteristics are inherited, because the facts brought

¹ *Ueber die Vererbung.* Ein Vortrag von Dr. August Weismann. Jena, 1883.

forward to establish this assumption may be explained equally well, and even more simply, by the principle of natural selection alone. He arrives at the conclusion that "all instincts arise simply by selection, that they do not have their root in the habits of the individual life, but in variations of the germ." But even if this principle of the inheritance of acquired characteristics and faculties is regarded as a postulate of comparative psychology, while the impulsive or instinctive in human consciousness may indeed be explained by means of it, it is wholly impossible to explain in this way, as some men think they can, all, even the higher faculties of the human mind. In transferring to human psychology a mode of thought which may suffice to explain animal psychology, no little caution is necessary; as is equally the case in transferring the standpoints of human psychology to that of animals. Man in his relations with his fellow-men has raised the psychical life of the animal to the level of spiritual life; his most distinctive products, speech dealing with concepts, invention, knowledge, conscience, artistic creation, have only very distant analogies in the life of the animal. Without denying the continuity of all psychical development, we cannot overlook the fact that, under the additional influence of social life on the life of the individual, a gulf has been made between the intelligence of men and of animals which is constantly growing greater. "Important as the struggle for existence has been, and even still is," says Darwin, "yet, as far as the highest part of man's nature is concerned, there are other agencies more important, for the moral qualities are more advanced, either directly or indirectly, through the effects of habit, the reasoning powers, instruction, religion, &c., than through natural selection."¹ And what Darwin says of the moral qualities of man, must apply equally to his purely intellectual qualities.

The animal can adapt its actions to the changed con-

¹ Darwin: *Descent of Man* (London, 1889), p. 618.

ditions of its environment, and from this power of adaptation we first have reason to conclude that it possesses intelligence. Man, on the other hand, can change the conditions about him, and adapt them to his mind. He knows how to call forth independently new conditions which correspond to his purpose. He creates tools for himself, and changes the external world by his work. He fills and changes the surface of his planet with the products of his industry and skill; and as his practical understanding shows its superiority to mere adaptation by its power of initiative, his theoretical understanding shows its superiority by its power to arrange the perceptions it receives, according to the concepts of his thought. This capacity which creates knowledge is the result of his thought-intercourse with his fellow-men, an effect of the universal social mind on the individual mind. Although this human intelligence may originally have been developed by the adaptation of reason to experience (by which here I mean mere perception), its progress and its real essence consists rather in the adaptation of experience to reason. So man analyses the phenomena which are given to him in perception, in order that, guided by the consciousness that reason is subject to law, he may discover laws of nature. This self-activity of reason is the source of active experience, as man has developed it in contrast with the prevaillingly passive experience of animals. Man not only has the ability to make the psychical processes of conception, judgment, and inference into objects for his consciousness, a faculty possessed by no animal so far as we know; he knows farther that these processes ought to be subject to a highest law, the law of the unity of thought with itself. He has a logical as well as a psychological self-consciousness, because he can connect his individual thinking with collective thinking, and subject it to the norms of the latter. Besides his individual desire he has the consciousness of a universal will, which

binds him and transforms his natural inclinations and impulses, even the impulse to propagate his kind, into moral impulses.¹

In spite of all one's admiration for the idea of the unity and continuity of life, of descent and development in organic nature,—as well as for the principle of the unity and persistence of mechanical force, that greatest scientific thought of the century—it is impossible to overlook the fact that certain followers of Darwin in natural philosophy have not imitated the master's example of wise caution. As in the age of Newton's philosophy everything, even morals, used to be explained by attraction working at a distance, so to-day the word development has become the scientific phrase which serves for every desired explanation, and is introduced into discussions where it has no meaning. If one listens to certain development-theorists, in particular Herbert Spencer, he is obliged to believe that absolutely everything must have developed, including even development itself. These philosophers seem to forget that, according to Darwin, development is no law but a result of laws, and that development is not a means of explanation but something to be explained.

§ 2. The constant repetition of the fact that the theory of development and descent solves the questions of transcendental philosophy, that the theory of selection furnishes the reconciliation, so long sought in vain, between the two rival schools of philosophy, the transcendental, which assumes *a priori* forms of knowledge, and the empirical, which derives these forms from experience, proves only that the question is not understood. No distinction is recognised between the transcendental investigation dealing with conditions of experience in general, and a psychogenetic problem which forms the subject of a particular

¹ The moral and the logical have a common source, the social consciousness. So all that is moral, in particular justice, is logical when considered from one side. This explains the relative truth of the intellectual systems of morals from Socrates to Kant.

science of experience, and so presupposes the results of the former investigation. The theory of innate ideas is confused with the assertion that science has *à priori* fundamental principles: although the fact that a certain form of thought is innate, *i.e.*, that it originates according to the development theory in the history of the race, makes this form none the less an *à priori* condition of knowledge for the individual. An idea which supposably or in fact is innate, is not *à priori*; but a concept which must be used in its relation to other concepts as reason and not as result, is *à priori*. *A priori* designates not a chronological but a logical relation between concepts. A concept which expresses a universal condition of knowledge may be called absolutely *à priori*. So, for example, the principle of sufficient reason is absolutely *à priori*, although we can deduce it from the unity of consciousness, since it is the condition of the conceivability of change. Since particular forms of association are thought to be inherited, one must grant that much may be born in the individual, and so precede his experience, which however does not have the meaning of an *à priori* form of knowledge. The question as to what is *à priori* in knowledge and what is not, comes up again with reference to innate concepts. It cannot be decided merely by proving the source of ideas. True the conditions of knowledge, so far as they are subjective, are rooted in the organisation of our mind; but not everything which is rooted in this organisation is on that account a condition of knowledge. The possibility of error is not excluded from the composition of our mind any more than the possibility of truth.

The universal forms of knowledge treated by the transcendental philosophy are the logical, not the psychological forms. Logical forms, however, originate in thought-intercourse; they have an historical, not a purely biological origin.

It cannot be repeated often enough that the question as

to the origin and développement of the forms of thought, has not at all the importance for the critique of knowledge which is ordinarily ascribed to it. The critique of pure reason, the transcendental critique, undertaken by Kant with the purpose of investigating the possibility of science, in order to decide the possibility of metaphysics, treats principally "not of the origin of experience, but of what is involved in experience."¹ In fact the problem which is proposed by the critique of knowledge, is not the question as to what in our knowledge has its source in ourselves, and what proceeds from things outside us; but rather the question, what concepts stand for the fundamental presuppositions of experience and science, and how these are proved to be such presuppositions.

If I show that the uniformity of events in nature forms the necessary presupposition for an objectively valid judgment as to change, this does not include the assertion that the consciousness of this uniformity precedes the perception of the change. And if it is beyond a doubt that an experience, a universally valid judgment as to an event in nature, could not be possible until this consciousness of uniformity arrived at development in some psychological subject, still there is no reason to suppose that it preceded the experience of the subject in time. Rather it constitutes the experience of the subject; in its connection with the perceived event it is the experience which the thinking subject forms for himself of this event.

The necessary conditions of experience in general must not be sought exclusively on its subjective side, any more than they can be found on its objective side alone. The penetrating question asked by Laas, What guarantees the identity and uniformity of myself, more than the identity and uniformity of space and of nature? is directed

¹ Although the above passage from the *Prolegomena*, as I now see, is only to be applied to the method of this book, still it expresses exactly and correctly the thought which distinguishes the critique of knowledge from the theory of knowledge.

merely against a psychological deduction, not against the critical theory of the forms of knowledge.¹ It is evident that experience is possible only so long and so far as constancy and uniformity really exist, and are thought as existing on the side both of the object and of the subject. Experience would be terminated, not only if we thought the constancy and uniformity of objects destroyed, but also if the subject ceased to be conscious of its own constancy in its idea of the objects; but it must be granted that objective constancy and uniformity can only be known through the identity of the subject of which it forms the correlate.

§ 3. The theory of descent and development in its application to psychogenesis, aims to make clear the agreement between the general forms of knowledge and the general relations of things, without the necessity of a roundabout transcendental proof. It explains this agreement briefly as the result of selection in the struggle for existence, by showing that only such forms of thought can survive as correspond to the real relations of things. And because these forms or concepts, it is assumed, have as their source the total preceding experience of the race, it should be at once plain why they possess that necessity for the individual's consciousness by which they are distinguished from all other concepts, acquired first in the personal experience of the individual. The transcendental proof finds itself supplanted by the biological, the simplicity of which leaves nothing to be desired.

How is one to think the adaptation of the logical forms of knowledge to external relations, when the exactness of these forms is absolute and ideal, and gives the standard for all empirical exactness? Or, of what use is an exactness which evidently far exceeds all the needs of mere existence? It is perfectly clear to us how the knowledge of logical laws has developed. We know definitely that

¹ Laas: *Einige Bemerkungen zur Transcendentalphilosophie. In den Strassburger Abhandlungen zur Philosophie.* Freiburg i. B. u. Tübingen, 1883.

it did not occur by adaptation to the logical forms of the external world. Nor are the principles of logic innate; they must constantly be handed down, for they do not express the natural laws of thought, but its normal laws. The same holds true of the fundamental concepts of mathematics. Between the concept of *straight* as geometry bids us think this, and the idea of lines bent or broken little as one will, there are no intermediate steps which could have been set aside by selection in the struggle for the existence of concepts. The concept cannot be thought with more or less exactness, and, instead of deducing it from representative ideas, *e.g.*, the edges of a crystal, it must rather be used as the norm by which such intuitions are judged.¹

Even the knowledge of the empirical characteristics of space cannot be explained by a gradual adaptation of ideas and the survival of the fittest. Or is it really credible that of the numberless beings which are said to have thought space in all imaginable forms, only those have survived which with accidental correctness thought space with three dimensions? Who would lay greater weight on such a proof that it is useful to think the spatial relations of things in three dimensions, than on the proof of the geometrician who erects three lines perpendicular to each other at one point? The sense of sight has not, as yet, attained any direct perception of the third dimension.²

The necessity of arranging our muscular sensations in the system of a continuous manifold, extended in three dimensions, does not originate with any inherited habit of the race, nor is it a law of our form of intuition *à priori*, as Kant teaches; it is a mechanical adaptation of the activity of the muscular sense to the relations of the

¹ If it is claimed that the concept of straight arises from the idea of crooked in connection with the negation of this, it is forgotten that an idea can, indeed, be destroyed by negation, but no other can take its place.

² Cf. Lipps, *Psychologische Studien*, Heidelberg, 1885, p. 69, *seq.*, and Riehl, *Philosophischer Kriticismus*, vol. ii. part 1. p. 148, *seq.*

very reality to which the sense and its activity belong, and which only in our thought is analysed into an objective and a subjective side, but apart from our thought is to be conceived as free from this antithesis.

§ 4. We meet the same difficulties as in the case of the mathematical and logical concepts, when we try to think the metaphysical concept of causality as developed biologically. Is the general principle of causality, the demand for a reason by which the change may become conceivable, to be referred back to the history of the race, or are the ideas of definite caused results to be sought there? The first assumption stands in evident contradiction with the facts, so that one could hardly be in earnest in asserting it. The conviction that the causal principle holds without exception, is confessedly lacking to-day among most men; and in antiquity, even philosophy does not seem to have recognised it until the time of Democritus. It is only modern science which makes the postulate that change has a reason the very basis of its investigation, and gives exact meaning to this postulate in its application to the external world by the principle that cause and effect agree quantitatively. Sense perception shows anything but complete obedience to law in the sequence of phenomena; instead of the conviction that things are causally connected, one could, with far greater reason, explain the belief in absence of law and in miracle, which, even to-day, prevails among the majority of men, as the inherited experience of the race.

There remains only the assumption that definite associations of ideas, *i.e.*, the predispositions to such associations, are inherited. For animal psychology, this assumption may be in great degree valid, although, as Weisnann shows, many of the phenomena mentioned as examples, *e.g.*, the instinctive connection between the look or the threat of an enemy, and the disposition to flight, may be equally well explained as the result of natural selection. But in the case of man such special impulses to perception, as

Schneider calls them, certainly are not to be found. Not even the fear of touching fire is inherited. Even if in earlier periods of man's development, definite instincts to perception were inherited, evidently the development of the general concept of cause must have been hindered rather than helped by this inheritance. The more perfectly a living being, either physically or psychically, is adapted to the relations of the external world, so much the less does it find occasion to advance to new adaptations.

That the proof offered by the theory of development for the validity of the general law of cause has not been successful, must be admitted. That which is clearly the reason of all scientific inductions, is made the result of wholly unscientific inductions. Do men really believe that the superficial experiences of the animal and half-animal ancestors of man have more weight for the development of his general concept of cause, than scientific analysis and experimental investigation, which are conscious of their end? The psycho-genetic theory knows no difference between the psychological impulse to complete in thought the perception of a change, and the logical postulate that the change has a reason. If the animal looks around for the source of a sudden rustle, or by certain signs detects the presence of his enemy, this impulsive activity of the mind has only a very distant relation to the mental operations of a student of nature, who himself produces the phenomenon that he aims to explain, and artificially introduces new circumstances, in order to become thoroughly acquainted with it. Between these two degrees of experience, there lies the whole self-conscious thought-effort of mankind up to the present time. Who desires to assert that the development is continuous, when the striking thing is rather the change in its direction?

It is not absolutely necessary to make a biological theory into a philosophical system, by using its prin-

ciples in the treatment of questions to which they can find no application. We prefer to leave the idle study of a Darwinian logic and critique of knowledge to our latest students of natural philosophy, who have their true prototype not in Darwin, but in Schelling and Hegel.

CHAPTER V.

METAPHYSICAL AND SCIENTIFIC SYSTEMS.

§ 1. THE understanding is stimulated by a twofold interest ; the complexity of phenomena calls for differentiation, and the essential unity calls for comparison and interrelation. The two interests work in opposite directions, but by no means exclude each other. The difference and multiplicity of objects is just as necessary for knowledge, as the power to satisfy the mind's need of a unified apprehension of things, by comparing and connecting them. Where nothing is to be distinguished, there is nothing to be connected. Analysis and synthesis demand each other and condition each other reciprocally ; as synthesis without preceding analysis is purely formal, and expresses only a consciousness of the form of possible connection ; so an analysis without succeeding synthesis, is without aim and direction. Every element of knowledge gained by scientific analysis receives its proper worth only as destined to enter into future synthesis. It is only in formal science which creates its own objects, only in mathematics, that the synthetic operations (addition, multiplication, &c.) precede the analytic (subtraction, division, &c.). This is the most striking difference between mathematics and physical science, and it is this difference which makes it dangerous to imitate mathematics in other branches of study, especially in philosophy. Except in mathematics, the synthetic thought that precedes the complete analysis of fact, has only the work of a provisional hypothesis ; it is indispensable in that it gives direction to farther analysis, but it can

only be used to explain particular phenomena, by bringing its results to bear on the phenomena themselves.

This double interest of the mind, the synthetic and the analytic (in Kant's language, the interest of universality and of definiteness), has ordinarily been expressed in this way:—The principles of things are not to be increased more than is necessary, nor are their differences to be overlooked as unimportant. The mind in its effort for system seeks to comprehend as many facts as possible, under the fewest possible grounds of explanation. Only the phenomena themselves limit this effort; the extent of its application is determined by their character and arrangement.

As no one individual feels the two interests with equal force, so the history of science shows whole periods in which the one or the other has prevailed. Periods of analytic investigation of detail, of specialised investigation, are followed by periods in which the results of such investigation are united, and general principles deduced. I avoid the expressions "inductive" and "deductive" for such periods. Though it must be granted that the process of induction starts with knowledge of facts, exact and as complete as possible, though its preparatory stadium is analytic, it is by no means confined to analysis of what is given in experience. In its farther progress, it cannot dispense with the guidance of, at least, a tentative synthesis; so that Claude Bernard's words, "induction is properly a conjecture by means of deduction," are characteristic and appropriate. Still the pre-eminently analytic periods of science may be regarded as empirical, and distinguished from the synthetic as inductive-deductive. As the former are characterised by a tireless, often aimless collection of facts, presented without guiding thoughts; so the latter are marked by the effort for a unified simple apprehension, for generalisation of inductive explanations, in a word by their philosophic spirit. For philosophy, in the most general meaning of the word,

is one with completed scientific knowledge, and recognises this unity. In spirit and in method it is synthesis in science. Our scientific age with its ideas of the indestructibility of force, and of the single origin of life forms, with its explanation of organic processes by the general laws of matter, and its connection of psychology with physiology, is eminently a philosophical age,—certainly more philosophical than the age of Schelling's and Hegel's philosophy of nature, although, more properly, because no so-called philosophical system can now assume control of science. What metaphysical systems constantly promised and never fulfilled, desired but never could reach, this is actually reached by scientific systems. On this basis of scientific experience, of an analysis of phenomena ever more complete, these systems state more and more fully the universal connection of scientific knowledge.

Certain thinkers to-day, still fond of metaphysical alchemy with its search for the philosopher's stone, the one conception explaining the world, have found it so difficult to defend their metaphysics, that they modestly offer to be satisfied, if their super-scientific ideas be allowed a hypothetical meaning. They forget Kant's words, that "it is absurd to try to prove the *probable* reality of such ideas; just as if one should think of proving the mere *probability* of a proposition in geometry." "To conjecture outside the field of experience, is to play with thoughts." This compulsory contentment is only the admission that metaphysics are really at an end. A hypothetical and merely relative metaphysics is no metaphysics at all. Exact proof is as essential to metaphysics as to mathematics. By the inductive method which must often use hypotheses and be content with probability, no metaphysical principles are reached, but only inductive results. He who promises us speculative results by the inductive method, either does not know what induction is, or he is consciously deceived. Since the objects of metaphysics are not objects of experience,

and cannot be; either knowledge of them must come from pure reason, and so cannot be hypothetical or relative, or there can be no knowledge of them at all, nor even a proof that they really exist. "Reason separated from all experience can only know *à priori* and necessarily, or not at all; its judgment is never opinion, but either forbearance from any judgment, or apodictic certainty."¹

Scientific hypotheses are introduced to explain phenomena, and are proved by phenomena. By such explanation, phenomena are made conceivable; by the verifying proof, the grounds of explanation are established as actual. How are metaphysical hypotheses to be verified? By proving that the phenomenal world as a whole is in agreement with them? This outlet is more than doubtful considering the absolute freedom of metaphysical hypotheses and our lack of control over them. What metaphysical hypothesis is there, with which the originator cannot show that the world of experience is in general agreement? He who personifies the unified connection of his thought of phenomena into a metaphysical being, may with Fichte make the world conceivable by assuming an absolute ego; he who regards understanding as secondary, may with Schopenhauer think that he has discovered in unconscious will, a conception to explain the world. He who with Spinoza regards time as a mere mode of the imagination, will explain the unity of things according to the schema of substance and attribute, while he who directs attention to the more noticeable fact of change and development in time, will seek a law of the world to connect all phenomena and explain each one. So it is always a single prominent trait of thought or of reality, to the exclusion of other characteristics, which is elevated into a metaphysical idea, and made the controlling element of the system. In metaphysical explanations, most, if

¹ *Kritik der reinen Vernunft: Disziplin d. r. V. in Ansehung der Hypothesen*, p. 598.

not all, depends on the art of selection, or rather of arrangement,—and one might decide between metaphysical systems by lot rather than by inclination or taste. A respected metaphysical thinker of our time demands that we complement our experience of the world by the *intuition* of a supersensual continuation of the world, and interpret the connection of things according to a plan, an Idea, the real meaning of which, however, as he himself confesses, is unknowable. What does the word intuition mean? and how does Lotze know so exactly that the unknown must be an Idea? Where does he get the right not merely to idealise the need of reason for a system, but farther to personify it, transforming the Idea into a unified intelligent power? Granted that spiritual being and activity cannot be explained from matter—and what scientific thinker would not grant this?—does it follow that matter must be explained from spirit?

Metaphysical systems are opiates for the mind, they benumb it instead of giving it life and clearness. They create the appearance of all-inclusive knowledge, which, if desire and fulfilment are regarded as one, it is not difficult to reach.

§ 2. The criticism of metaphysical systems must strip off the lustre from their Ideas, and must destroy the æsthetic impressions produced by the unity and completeness of these artistic creations of thought; it must finally disregard all other motives to system-making except such as are purely scientific, though it is well known that systems owe their influence more to non-scientific motives, than to the power and conclusiveness of their proofs. What metaphysical system has found the proofs of another convincing?

There may yet be a doubt whether a criticism of metaphysics in general is still in place, whether this problem has not been solved already. Is not the impossibility of metaphysics as a science, a demonstrated

truth since Kant's transcendental dialectic was written more than a century ago?

The peculiarity of Kant's procedure is that he attacked metaphysics, or what he regarded as such, with its own weapons, and tried to disprove it by its own method. He would prove from pure reason, and make it an object of knowledge *à priori*, that we cannot know metaphysical objects. The knowledge of its uncertainty, which is only possible by critique of the reason, is itself science. After having proved in the positive part of his work that the valid use of the categories is limited to experience, that our *à priori* knowledge only exists in relation to the formal grounds of experience, that therefore the "proud name of Ontology, which proposes to give synthetic knowledge *à priori* of things in general, must give way to a mere Analytic of the pure understanding;" he undertakes to show in the negative part of his work that the procedure of pure reason is necessarily dialectic, *i.e.*, can only lead to the appearance of proofs, and that the assumption of metaphysical objects, a simple soul-substance, a totality of phenomena given in possible experience, and a most real being, rests on false conclusions. Fundamental as this undertaking was, and although in fact it removed from science once for all a certain form of metaphysical dogmatism, yet Kant's idea of metaphysics was not comprehensive enough; and his work has suffered from certain lacks due to his purpose to supplant a dogmatic metaphysics on theoretical basis, by a dogmatic metaphysics on practical basis.

Kant criticised not metaphysics proper, but the metaphysical sciences, rational psychology, cosmology, and theology, and that especially in the form which Wolff had given these sciences. He even conceived his critique as laying this foundation for a future system of pure reason, a metaphysics "in the form of a science." He indeed left no basis for this science by his refutation of the ontological argument. Every metaphysical proof is

based on the conclusion from concepts to the existence of objects in harmony with these concepts. But this more general reach of the ontological proof seems to have escaped him, for he only subjects the scholastic form of it to criticism.

Kant recognises two conceptions of metaphysics, one scholastic, which he regarded more important, at least so far as the final aim of the science was concerned; and one critical, which limited metaphysics to those principles of nature and of morals which are independent of experience. Freedom of the will, hope of personal immortality, belief in the existence of God; these primary objects of scholastic philosophy, as Schopenhauer calls them, Kant still treated as the essential problems of metaphysics in its first meaning; the transcendental dialectic was to determine the possibility of *this* metaphysics. The decision of this battle of reason for the existence of those supersensual realities, is not quite impartially rendered. Though the critique of pure reason arrives at the conclusion that affirmation and denial of those objects of belief are alike without foundation, yet Kant lets slip the remark:—as reason is entirely unable here to make positive assertions, so little, and *still less*, has it the knowledge necessary to make any denials of these questions.

The second conception of metaphysics the critique leaves intact, indeed it would by its theory of experience establish for the benefit of this the fact that a practical dogmatic use of reason is possible, and would create a basis for the same. Such a metaphysics consists of the pure sciences of nature and of morals, for Kant thought it possible to separate entirely the pure and the empirical parts of these sciences. After having developed the basis of experience as a system of categories, he deduced from these categories not merely the principles governing the investigation of nature, but also the most general mechanical laws of nature. He constructed the object of physics: matter *a priori*, and in so doing appar-

ently presupposed only the existence of a "movable in space." Analogously, to get a basis for ethics, he thought it "unnecessary to borrow anything at all from the knowledge of man." He regarded the pure conception of a moral law sufficient. It is not difficult to see that this could not really be carried out. In fact, experience could as little be excluded from a pure science of nature, as from the metaphysical proof of a moral system binding on all reasonable beings. As the latter takes from experience the relation to social life already included in the formula of the moral law, and the consciousness of duty which, as Kant himself showed, presupposed an empirical will affected by sense desires; so in the construction of matter, the antagonism of the two fundamental forces certainly points back, whether correctly or not, to specific experiences. For this reason, Kant was obliged to treat both forces as inexplicable.¹ The exceedingly artificial structure of the transcendental dialectic is linked with the distinction between Ideas of pure reason, and concepts of the understanding. But a closer examination of Kant's deduction of these Ideas shows that they are simply the categories indefinitely extended. So the distinction is lost between a pure theoretical reason, as the special organ for metaphysics, and the speculative use of the understanding; this is all the more true since the fundamental principle on which rests the deduction of particular concepts of reason as suggested by the forms of inference, cannot stand criticism. "There will be as many concepts of pure reason as there are kinds of relation, which the understanding thinks through the categories" [of relation], says Kant, and thereby grants that the concepts of reason coincide with certain con-

¹ It was not simply a systematic interest, but also the feeling of the imperfection of his *Metaphysische Anfangsgründe der Naturwissenschaft*, which led Kant in his old age to seek a "transition" from pure to real physics. That which deserves attention in this, is less the hypothesis of a universal fundamental matter in motion, than the attempt to determine the system of moving forces in matter, by counter forces exercised by the subject in perception.

cepts of pure understanding, and can be nothing but these concepts used absolutely, *i.e.*, misused. The unlimited character of the mind's activity is transferred to things themselves,—the negative characteristic, absence of anything in the mind to prevent constantly repeated use of the concepts *reason* and *cause*, is transformed into the positive thought of an all-comprehending causality, of a first, or if preferred, a last cause. The Ideas of reason are, to use Dühring's acute and appropriate phrase, infinities of mere logic. The concept of a first cause is the same in kind as the idea of an infinite number existing by itself.¹ The fundamental principle of pure reason, which is to justify and indeed render necessary this misuse of the understanding, the conclusion from the conditioned to the complete series of conditions and therefore the unconditioned, has already been proved incorrect by Schopenhauer.² Its incorrectness follows from Kant's own theory. This principle, as Kant himself remarked, cannot be analytical, "because the conditioned is indeed related to a condition, but not to the unconditioned." So much the less is it a valid, even a possible synthetic proposition, because for this, as we already know from the Transcendental Analytic, the relation to possible intuition, to a schema, would be necessary, and there is no such schema for the principle in question. A schema for it can be found neither in the concept of the completed use of the understanding's knowledge, this rule of reason for the benefit of the understanding; nor, as Kant sought, in a concept of those transcendent objects which arise from the Ideas (by hypostasising them), because these Ideas are first created by the principle in question.

Kant asserted that a "transcendental illusion" clung to

¹ Dühring, *Natürliche Dialektik*, 1865, p. 112.

² *Welt als Wille und Vorstellung*, 1859, vol. i. p. 572. "From this it is evidently false, that the conditions to a conditioned can as such make a series. The series arises only by regarding that which was condition as again conditioned, which, however, is beginning the whole operation over again, and using the principle of sufficient reason anew."

the false conclusions of reason, which, as one sees, do not stand a moment before the forum of the understanding; and that this did not disappear like a logical illusion "even when one had discovered it, and had clearly seen its falseness by transcendental criticism." He compares this illusion with a sense-deception, and speaks of "sophistications not of men, but of the pure reason itself." In view of this strange assertion, is it severe when Schopenhauer declares that Kant regarded the errors of the Leibnitz-Wolff philosophy to be necessary errors of reason, and so made reason itself the sophist? The question whether the false conclusions of the Wolffian metaphysics, even in the form Kant gave them, can produce transcendental illusion or not; whether they really, like a sense-deception, continue to "flit before reason," even after criticism has discovered the point of misunderstanding, the confusion "of a subjective necessity of uniting certain conceptions in favour of the use of the understanding, with an objective necessity determining things themselves,"—this is a question of fact, as to which every one can give a decisive judgment. Neglecting for the moment the antinomy in the conceptions of the world, the only example given by Kant to show this necessary discord in the power of thought, the answer is undoubtedly *No*. He whom Kant has taught that no conclusion is valid from the simple in abstraction to anything simple in the object, that the conclusion from the simple form of the ego to a simple being, the soul (and analogously from the abstraction of extension to a simple atom, a point!) is a false conclusion; he who has followed and understood the refutation of the ontological proof, can no longer be deceived by these delusions of scholastic metaphysics.

Kant deduces the *objects* of metaphysics from the concepts of the understanding used absolutely; rather he should have deduced from them the *systems* of metaphysics. In fact, the last formal distinction between

systems is rooted in the different concepts of the pure (*i.e.*, isolated from sense) understanding; used in forming the system. That the demand for systematic unity in the empirical use of the understanding or of the reason, must necessarily lead to the assumption of a highest being; that the reason, as Kant thought, can only think this unity thus, namely, by granting the highest being as object of this idea, inasmuch as a necessary relation exists between the disjunctive conclusion (the conclusion by systematic division) and God:—this is first understood when one learns that a metaphysician's system is his real God. So Dühring says, "Universal systematising is the last and highest object of all penetration into the being of the world; cultivation of this is the only worship which remains for thought and will after the errors of popular phantasy (!) have been stripped off."¹

Kant did not fully break through the charmed circle of the metaphysical mode of thought which he attacked. He himself granted too much to the methods and the spirit of the school-metaphysics, against which his attacks were especially directed. This does not lessen his real service in criticising the "science of reason, based on mere concepts," nor does it lessen the meaning of the important part of the Dialectic "on Paralogisms," which contains much more than a criticism of rational psychology, nor of the refutation of the ontological proof, which attacks the very foundation of metaphysics.

§ 3. Metaphysical speculation separates synthesis and analysis. One or the other, ordinarily synthesis, it makes the exclusive interest of the mind, and so reaches either a formal unifying conception or an abstract conception of multiplicity, apprehended in as one-sided a way as the unity. Monistic systems on the one side, dualistic and pluralistic on the other, give form and expression to these opposite impulses of metaphysical thought. The second class of systems is historically,

¹ *Cursus der Philosophie*, u. s. w., Leipzig, 1875, p. 40.

and in substance, only a reaction against the excessive effort for unity, to which the first class of systems are due. The mind's need of distinction and definiteness which theories of unity check and repress, seeks to win its rights again in the pluralistic systems. Such in Greece is the relation of the philosophy of nature and atomism to the abstract monism of the Eleatics; such is the antithesis between Leibnitz and Spinoza, between Herbart and the idealistic philosophy. Still pluralistic systems, especially dualistic, have a tendency to become monistic again, as we see from the example of Lotze in his relation to Herbart. The theory of unity thus arising from a pluralistic system, is called concrete monism. The true home of the philosophic art is the region not of multiplicity and difference, but of unity and harmony. The spirit which feels itself one with the ground of all being, is the poet of monism. The spirit and its desires ever run ahead of investigating thought, and it knows itself ever at its goal.

Unity and multiplicity may be conceived in two ways. The totality of things presents itself to intuition and thought in the form of persistence, and the form of change,—as existence in space, as development in time. Logically the concepts of substance and causality correspond to these. According as the philosophical consideration of things has been directed to the one or the other of these forms, according as metaphysical thought has been controlled by the concept of substance or of causality; systems of being, or systems of becoming and development have been the result. If we connect this standpoint with that before mentioned, we have on the one hand monistic theories of being and development, on the other, pluralistic systems of being and development. All systematic thought is confined to these antitheses; so it is by no means without limit, but the subjective needs of the mind, and the most general forms of phenomena determine its course.

What is here described and classified in dry abstract expressions, the movement of metaphysical thought, has wrought itself out historically in forms full of fancy and of life, which for a long time crowded out the methodical, never completed systems of science, and which still do so for many. The completeness of our classification may be tested by its comprehensive application to all systems. The possibility of classifying all systems completely in the way indicated, is at the same time proof that the systems have subjective basis. Only subjective systems can be classified *à priori*, i.e., starting with the subject.

All types of systems (perhaps excepting pure pluralistic evolution) were developed in ancient philosophy. Antiquity is the classical age of philosophic systems. Study of nature led the first Ionic thinkers to a monistic theory of being. Persistence of matter involuntarily forced itself on the attention of the natural philosophers, and they express this principle in a qualitative form, not yet quantitatively definite. They seek a fundamental matter, a single thing from which all phenomenal things arise by compression or expansion, or out of which they come by separation. The theory of Heraclitus is, in contrast with this monistic system of being, a monistic system of becoming. Though Heraclitus did not separate the process of nature from matter, function from substratum, he directed attention pre-eminently to the form of the process itself. His philosophy is a doctrine of flowing, of the restless change of things. Because things are thought as constantly changing and developing, they must consist of fire, or heat-matter, this most active element in nature. At the same time Heraclitus attempts to solve the fundamental problem of all monistic theories of development, by refining all processes of becoming and of change into a single world-law. Not merely are all processes in the external world mere specialisations of the universal law of division and recombination, of the unity of opposites, the associated

effect of force and antithetic force; the political laws of men also flow from the same supreme law of nature.—The Atomists developed a pluralistic theory of being, in contrast with the abstract Eleatic doctrine that being is one and singular; and this latter, as taught by Parmenides, may itself have first appeared as antithetic to Pythagorean dualism.¹ Nor are examples of pluralistic systems of development entirely lacking in Greek philosophy. The homœomerics of Anaxagoras are in one way to be compared with Leibnitz' monads. As these latter contain the whole universe in idea and evolve it from themselves by their own activity, so in the former the qualities of all things as real are included and developed in orderly manner by the discerning mind (*νοῦς*). On the other hand, Plato's metaphysical system (if it may be called a system) is a pluralistic theory of being, in so far as the Ideas are to be regarded as individual, self-existent, outside the reach of becoming and change. Plato once more expresses the reason's effort for unity by putting the good at the head of his series of Ideas.²

That the standpoint from which a system is constructed does not always appear in its purity, that later systems should attempt to unite these standpoints, must seem natural and cannot disprove the correctness of the analysis. As Plato assigned Eleatic being and Heraclitian becoming to two separate worlds, only one of which was truly real and independent; so Aristotle distinguished the forms of material things from absolute non-material form, in which as purely spiritual he recognised the

¹ Parmenides, later called ὁ ἀρχὴ Πυθαγόρειος (so Zeller, treating of Strabo), followed the Pythagoreans in Physics (cf. Tannery, *La physique de Parménide*, *Revue Philosophique*, 1884), while defending a metaphysical standpoint antithetic to the Pythagorean principles of things, in that it excluded number and multiplicity.

² The series of Ideas or Ideal numbers, in distinction from mathematical numbers, cannot be summed up, i.e., it forms no compound whole, because every Ideal number expresses a different mode or essence. Still in the Sophistes, Plato seems to have transplanted the element of difference, of change, into the "super-heavenly place" of Ideas themselves, and so to have brought at least ideal life and motion into the realm of "things-in-themselves."

nature of God. So far these theories are undoubtedly dualistic. Platonic transcendence, the χωρισμός of Ideas, is not entirely set aside by Aristotle, but only limited to highest, self-sufficient being. But so far as Aristotle regarded the forms of material things as moving forces, as the self-developing ends of things, his system must be called pluralistic evolution. In modern philosophy the systems of Bruno and Spinoza give us at once the antithesis between a monistic theory of development and a monistic theory of being. Countless worlds, in Bruno's poetic language, countless heavens, each revolving about its sun, but everywhere in the universe the same life rising to sensation and reason, only in infinitely many forms—this figure of the external infiniteness of the world Bruno complements with the conception of its inner infiniteness, by his thought of a nature creative from within, of the unity of matter and force, which caused forms to appear, as it were, on the surface of matter, only to return again into its bosom. And this divine nature, this creative force of the universe, is one in all its parts; it is the monad of monads, and at once the being of every single thing; every monad is the source of one and the same development. Within a single mode of conception there can be no greater antithesis than between the monism of Bruno and of Spinoza. For the former, the fundamental element of nature was causality, that creative divine principle which is entire in the whole, and entire in each part; for the latter, it was an unmoving being, substance, including all things in itself; for the former, things were developing an infinite out of themselves by the power of the whole; for the latter, they are merely states of substance, connected with the conception of this by an endless series of logical, not chronological, mediations. Is it any longer a matter of doubt that the person and the system of the metaphysician belong together as much as the poet and his work?

In antithesis to Spinoza, Leibnitz transformed Bruno's monistic evolution into pluralistic evolution, apparently not without feeling Bruno's influence. Bruno's monad of monads is for Leibnitz the highest, no longer the only being; the development processes of individual substances run parallel without real interaction.

In contrast with the monistic theory of development in German Idealism from Fichte to Hegel, Herbart finally established his pluralistic theory of being, which explained the empirical course of events in nature as fortuitous, and regarded as a true event only the avoiding of what would happen, were it not for the self-preserving character of beings.

The classification of systems is a means of criticising them. It would not be possible to reduce systems with such non-homogeneous content to the antithesis of being and development, unity and multiplicity, unless the source of all systems were immediately subjective. The metaphysical thinker seeks to know the principle of things beyond experience; no wonder that after abstracting from phenomena, he reaches the principles of his own thought, rather than the principles of things.

§ 4. Science also seeks to satisfy the same desire for unity in thought which the metaphysical systems satisfied too quickly. It is distinguished from metaphysics in method, not in aim. It does not confuse desire and attainment, and is not satisfied with self-sufficient, self-occupied thought. To satisfy the subject's need for system, it seeks exact measurement in objects.

Sense-intuition, mathematical and logical thought, are the mind's inner means of knowing things. These subjective means of knowledge were used one after the other by pre-Socratic thinkers to construct philosophical systems. Nor does science know any other means of knowledge, but it knows and uses another external means of investigation: the experiment, or more generally, verification. The single step beyond mere speculation which science takes

by verification separates it from metaphysical philosophy. Pure speculation is limited to logic and mathematics; outside these sciences it becomes a metaphysics which is nothing but an unverified, and by nature unverifiable, knowledge. Where there is no possibility of verifying any assumptions of theory by phenomena, the sphere of investigation ceases, and the sphere of speculation and subjective thought-creation begins. Experimental, verifiable science is the unity of speculative and of purely empirical science. If pure speculation (in the sciences of reality) be like a soul without body, pure empiricism like a body without soul, experimental science may be compared to a living organism.

The demand for verification is not limited to external investigation of nature in distinction from internal. Exactness is not confined to the sphere of measurable things and processes, though most easy to find here; no more is confirmation by definite fact, closely connected as it is with exactness, confined exclusively to the sphere of material investigation, although the necessity for it was first noticed here. It has been definitely proved that the simplest psychical processes—sensation, association, memory—may be subjected to measurement, and in certain degree to measuring experiment. The method of physical science, in its essential features, applies everywhere. Any sphere of scientific knowledge that claims to be exempt from it, thereby denies its claim to be a science. The mental and moral sciences, now just beginning, though so long the subject of speculation, must be verified by history. Even the science of knowledge, pure theoretical philosophy, cannot refuse to confirm its essential assumptions, or it sinks to mere speculation in regard to science. Hume's demand that every conception be deduced from a sense-impression, expresses simply the demand for its verification. It may reasonably be doubted whether Hume's demand applies also to such conceptions as are derived from the form, not the

content, of experience; but beyond a question he gave the only means for proving the content of a conception real. To prove the fundamental proposition that the certainty of facts is essentially different from the certainty of a logical or mathematical conclusion, Hume points out that the opposite of a fact never involves contradiction, but remains thinkable, however strange to ordinary views. The immediate inference from this is that the existence of a fact cannot be deduced from mere conceptions, and from such combinations of conceptions as involve no contradiction. It can hardly be asserted that such a verification is less convincing than the numerically definite verifications of physical science, and that, therefore, it is impossible to prove a philosophical theorem beyond all doubt. The general science of knowledge, which treats the principles of knowledge, the fundamental conceptions and laws of scientific method, can and must verify by existing science the assumptions from which it explains science. A theory which tries to derive science from pure experience would be refuted by the actual method of science. No philosophy can call itself exact which does not prove its propositions, and prove them not merely by abstract logical reasoning, but by actual reference to the phenomena.

Only when the thing is first formed by the conception and so the two are identical, as in pure mathematics, or when it is a question of what ought to be, rather than what is, as in ideal ethics, does this demand for confirmation by experience lose its meaning. In these branches, as Kant rightly says, experience may become an illusion. But even ideal ethics which is concerned with laws proper, *i.e.*, laws of will, must link itself to present, actually felt interests of the will; or else its sketch of perfect action will be as much a matter of indifference as is the construction and computation of geometrical figures for one not a mathematician.

A geometrical proposition remains true even if there

is and can be no object completely corresponding to the conceptions involved; for it treats of this object not as existing, but as thought according to a posited rule of construction. A moral command remains binding, even if all men find themselves exceptions to it; for it does not aim to describe or explain the actual relation of men, but to regulate their possible relation. Truth and reality cannot be separated at all in mathematics; the truth of mathematical objects is the only reality which mathematical objects as such possess. Moral laws, on the other hand, hold true not of an experience which has already been realised, but of an experience which ought to be realised. The objects of mathematics, and the actions with which ethics deals, are ideal objects and ideal actions. But metaphysics, much as it may have to say about the Ideas of being and change, seeks also to know the principles of actual being and change. It cannot, like logic and mathematics, be satisfied with mere truth, nor with the possibility of its assumptions, and their appropriateness, as is ethics. It must prove their reality. But it thereby ceases to be metaphysics and becomes scientific investigation.

Knowledge of the actual could be deduced from mere conceptions only on one supposition, namely, that the conception, the thought, alone has reality. On every other assumption, even that of *a priori* conceptions establishing the form of experience, the transition from the truth of the conception to the reality of the object is only possible through sense-perception. That the presupposition in question is false is shown by the fact that experimental science exists. This must have long ago been set aside, like the empirical mathematics of the ancient Egyptians, if Hegel's so-called discovery were true, that nature is the objectified process of the metaphysician's thought, the "thing-in-itself," the philosopher's conception.

§ 5. There is a remarkable discrepancy between the extravagant promises of the metaphysician, and the modest

way in which they are fulfilled. It is claimed that particulars can be explained from the conception assumed as fundamental, whatever this may chance to be; or at least that they can be made more conceivable than without this assumption. Its peculiar problem and unquestioned merit consists in explaining the particular from its relation to the whole. And if the will could pass for the deed in science, this its merit could scarcely be denied. But can the metaphysician name a single explanation of a single phenomenon which he has not borrowed from science, or reached by abandoning his own method for that of science? Spinoza indeed assures us that every single phenomenon as modification of the infinite substance is grounded in it, through a series of infinitely many mediations; so the individual is to be conceived through this infinite substance. A mode of extension (i.e., any real body) must be caused by another mode of the same kind and grounded in it, and this again by another, and so on *ad infinitum*. Does this statement mean more than that the causal relation of material processes must be conceivable, if it is to be at all possible to conceive it? On the basis of this assertion, which only expresses a principle of investigation, did Spinoza discover a single chemical or physical phenomenon, or any natural law? It may be objected that the discovery of natural laws is not the problem of metaphysics, which merely deals with the relation and connection of laws previously discovered by science. I shall come back to this objection and show that the methods of metaphysics cannot reach the relation of natural laws any more than it can discover them. It is enough now to ask what sort of a science it must be which has nothing new to discover, nothing unknown to refer back to the known. But metaphysics has not been any the more fortunate on its own ground, the synthesis of conceptions. Did Spinoza really prove his fundamental proposition that matter is one and unique?

Is not this merely a combination of the definition of substance with the definition of infinite substance? while these definitions are given as his own, and to this extent are capricious. "*I mean* by substance that which is thought in and by itself. . . . *I mean* by God, the absolute, infinite being." The man who does not identify the definition of a thing with the thing itself (and this can only be done in logic and mathematics) will miss in Spinoza's argument but one point, small and yet decisive, *i.e.*, the proof that infinite substance really exists. The world of metaphysics is a thought-world, an imaginary world of logical shadows, which have lost their reality with their existence for sense-perception; it is not the world of real things and processes, *i.e.*, those which affect sense. Still men undertake to add a world given in perception to the thought-world of Spinoza. In attempting to translate his metaphysical abstractions into concrete images, who would have chanced on the idea that the visible cosmos was to be represented for sense-perception as a multiplicity of countless systems, each with independent motion, each separated from the others by tremendous distances only crossed by rays of light? Is it not rather necessary to think the universe as immense compact masses in which all things are united? *ὁμοῦ πάντα χρήματα ἦν, ἅπειρα καὶ πλῆθος καὶ συμκρότητα*. Anaxagoras gives in forms of sense almost exactly this theory of the world which corresponds to the abstractions of Spinoza. The very sense-perception of the real world is a refutation of Spinoza's world of thought.

In attempting to realise the metaphysician's dream, the discovery of a universal formula of knowledge, no one in the ancient or modern world has excelled Hegel, the absolute metaphysician. Hegel undertakes in all earnestness to supplant science by metaphysics. He treats the results of scientific investigation with utter caprice and unconcealed disdain; he changes and arranges

them till they fit into his system, or discards them entirely. As to physical sciences, it is known that this attempt is an entire failure; it is less widely recognised, but quite as instructive, that this method has met with no better fate in the sciences of mind.

According to Hegel, thought creates its own objects, and these objects are "things-in-themselves," things real and material, and not merely existent for thought. The all-powerful concept as Idea produces out of its dialectically revolving bosom, not merely men, animals, and plants, but mountain-ranges and continents. "The destruction of the existing moment of totality, and the pure separation by abstraction—stratified mountains. The analysis into indifferent being—land formed by water deposit."¹ In fact, it is not enough to say that with Hegel thought creates things; it exactly coincides with them. "The method is nothing in distinction from its object and content, for it is the content itself, the dialectic which it involves, which carries it forward."² The philosopher's method, and the process of nature, are therefore one and the same—a convenient method, which can never miss the mark, for there is nothing outside it to set a goal for its progress. This system is no longer the statement of the world in forms of thought; it is the world itself. The world a metaphysical system! certainly the haughty assertion of human thought, that little motion in the brain, cannot be carried farther.

It is unnecessary to present in detail that caricature of science and reason called the Hegelian philosophy. It is enough to glance at its method, and the great licenses this involves.

The inability of his method to explain nature, Hegel dares to treat as the inability of nature itself to carry out its own thought-determinations. "It is the inability of nature to keep the thought-determinations in their abstractness. In the inability of nature to preserve the

¹ Hegel, *Werke*, vii. 1. p. 445.

² *Ibid.*, iii. p. 39.

concept during its development, lies the difficulty and oftentimes the impossibility of finding fixed distinctions for classifications by empirical consideration. This inability of nature sets limits for the philosopher, and it is entirely out of place to demand of the concept (*i.e.*, the philosopher) that it should comprehend such accidents."¹ He who causes the real to be created from the conception, who asserts that the conception alone is real, has thereby acquired the right to blame as out of place the desire to see how the real is deduced from the conception. If this postulate be set aside, what is his whole science but conscious illusion. Hegel speaks occasionally of the "weakness of the concept in nature."² Read *Hegelian concept for concept, and knowledge of nature for nature*, and there would be some truth in the statement. "The forms of nature are not to be brought into an absolute system." Certainly not, and the only conclusion from this is that we cannot treat the artificial divisions of our systems, the degrees of abstraction in our thought, as absolute limits of nature. But Hegel concludes that the "genera of animals are subject to accident;"³ *i.e.*, where we cease to understand nature, nature ceases to follow law!

Hegel's idea of an empirical proof, a proof that anything is real, is so remarkable, and so characteristic for metaphysics in general, that we cannot omit it. "After fixing the thought, so far as the concept necessarily determines this, one should ask how it (the thought) appears to concrete imagination, then follows the assertion that space corresponds to the thought of pure externality (*Aussersichsein*) in the intuition of space." As Hegel says later in explaining his method, it is necessary to notice what phenomenon suggests the thought-determination already fixed.⁴ Suggestion, a suggestive simile, is what Hegel means by empirical

¹ Hegel, *Werke*, vii. 1. pp. 37, 38.

² *Ibid.*, vii. 1. p. 653.

³ *Ibid.*, p. 651.

⁴ *Ibid.*, p. 653.

proof! At length we can understand the following remarkable problem for empirical proof. "That this thought-determination, self-identity, or the abstract self of centrality which has matter in it, that this simple ideality as existing is *light*; this is to be proved empirically."¹ What possible empiricism could show that light was hidden behind these abstract formulæ, and not something else, such as air or water? Do not these formulæ suggest nonsense, among other possibilities? From this height of pure thought the philosopher looks down to direct theoretical and experimental optics, and to declare their hypotheses of no value. "The Newtonian theory that light moves in straight lines, and the wave theory that it spreads out as waves, are materialistic representations, of no service for the knowledge of light."² The theories of emanation and of vibration are incapable of explaining the phenomena because they are materialistic, not speculative, that is to say, not pure inventions.

In Aristotle's account of the Pythagoreans we have a classical witness for the fact that then as now the method of analogy was the method of metaphysics. "The Pythagoreans thought they found in numbers much similarity to being and becoming, more similarity than in fire, in earth, or in water. . . . So they regarded the elements of number as elements of all that is, and the whole world as harmony and number. They *fitted together* those characteristics of numbers and harmonies which they found to agree with the forms, the parts, and the whole arrangement of the heavens; and if anything was lacking, they sought to introduce connection and agreement into the system by other means."³ For *number* read *concept*, and the description applies to Hegel's method.

§ 6. The metaphysician regards the world as one whole, and treats the problem of its explanation as indivisible.

¹ Hegel, *Werke*, vii. 1. p. 137.

² *Ibid.*, p. 141.

³ *Metaphysics*, i. 5.

This habit dates back to the Ionic philosophy of nature. This offered an impersonal history of the world, instead of that personal history which poets had given in theogonies and cosmogonies. Great as was Thales' service in stripping personality from Oceanus and Thetis, parents of the gods, yet we cannot overlook the fact that the objects of thought did not change with the new naturalistic mode of thought; perhaps, indeed, they could not change while the Greek mind remained what it was. As compared with science, metaphysics to-day exemplifies an older type of thought. In its monistic systems it defends the conception of unity in an exceedingly uncritical way, by transferring the necessary unity of thought to the objects of thought; and it is not conscious that this transfer is purely a demand of thought, a principle applying only to method. This is just what the Ionics did in concrete form, and later the Eleatics in abstract logical form. Yet still the systematic philosophers, like those beginners of science, seek a final, original thing, a highest genus of being to contain all its determinations. Its goal remains the same whether they call this thing matter or spirit, or seek to deduce all that happens from a single law, as Hegel, who deduces it from the dialectic self-activity of the conception, or Herbert Spencer, who explains it by one formula of development, which has to change the meaning of the words used for every group of phenomena to which it is applied. For purely logical reasons, the goal of metaphysical systems can only be sought in the conception of a highest genus, or of a supreme universal law. For a system is formed either by arranging things in classes till lower classes are comprised under one all-embracing highest class, or by subordinating processes to a single universal law. The metaphysician who starts with the conception of a highest genus of being, presents his system according to the schema of spatial representation. Spinoza's maxim, "All that is, is either in itself or in

something else," is the best example of this. And he who undertakes to deduce the laws of nature from one world-law, uses for this the time-schema of cause and effect.

In fact it is only by subjective analogy that we can transfer these concepts by which systems acquire unity (highest genus and first cause) to the real connection of phenomena. It is plain that we must make nature systematic in order to comprehend it. But the concepts by which we make it conceivable are degrees of abstraction in our thought of nature, not the causes or the reasons of the nature process itself. So it is impossible to decide *a priori* how far the systematic unity of objects, *i.e.*, of the content of experience, reaches.

Science seeks no less eagerly than metaphysics for unity and connection of knowledge. But it asserts no more unity and agreement among things than it actually finds, and can prove experimentally. The presupposition of any more fundamental unity is merely a maxim for thought, until it is accredited by approved facts—*e.g.*, the advances in chemistry have by no means decreased the number of elements, as the systematic impulse of pure thought demands, but have increased it. And should this number be decreased by farther experiments, there is not the slightest prospect that Prout's hypothesis referring everything back to the hydrogen atom, or the half of this, will be proved. The simple relations of atomic weight presupposed by this hypothesis do not occur, as Staas has shown by careful experiment. Attractive as may be the thought of a completely homogeneous identical matter, chemistry must regard it as pure speculation so long as the atomic theory stands, and must deny to it anything in common with true principles and results of exact investigation. Though fully recognising the mind's need of unity, we cannot hesitate between Prout's hypothesis and the atomic theory, for the latter is based on the law of chemical proportions, and it has been proved

that atomic weights remain unchanged in all combinations. And why should not the independence and unchangeableness of elements be just as fundamental a fact as that they affect each other reciprocally, and that their qualities are relative?

§ 7. The method of metaphysics in making systems is the very antithesis to the method of science in its generalisations. Metaphysics generalises by abstraction to form its systems; science extends its concepts by a process allied to that by which mathematics forms concepts and makes them general. The concept logically more universal is formed by eliminating certain attributes belonging to the species. Less is thought in it than in the conceptions of knowledge. Conversely the more general conception in mathematics has the greater content; more is thought in it than in the special concepts deduced from it. Compare, for example, the universalised expression of the Pythagorean relation, the cosine theorem, with the Pythagorean theorem itself. And the process of extending concepts in the exact sciences governed by the mathematical method is analogous to the same process in mathematics. At least it is never a mere logical subsumption of concepts, but it always depends on the discovery and introduction of a new fundamental fact, by which groups of phenomena, before treated as separate, are found to be really connected. The connection between the theory of heat and mechanics was not effected by regarding heat as motion, and therefore to be subsumed under the general laws of motion. This thought was often expressed on the part of philosophy before anything was known of a mechanics of heat. The German originator of the new theory was inclined to assume the opposite, that "motion must cease to be motion, either simple or vibratory as light and radiant heat, in order to become heat."¹ The decisive

¹ J. R. Meyer, *Die Mechanik der Wärme*, 1st ed., p. 10. Cf. Dühring, *R. Meyer, Chemnitz*, 1880, p. 17.

discovery which involves the indestructibility and transformation of energy is found in the numerical equivalent. This number, which expresses a constant quantitative relation between thermic and mechanical processes, not the conjectured nature of heat as motion, formed the bridge between mechanics and thermo-physics, which could not be created by purely logical speculation. It is unnecessary to seek farther examples in support of our assertion. In order to transfer the laws of one sphere of phenomena to another sphere, it is first necessary to prove that connections exist in fact between the phenomena of both spheres. Real progress, scientific extension of knowledge, only takes place by finding such connecting facts, not by finding analogies between concepts. In the widest sense of the word, anything is analogous to anything and everything.

§ 8. So it were no difficult task for Herbert Spencer to find by pure abstraction a universal law of development, which applies in like manner to the development of the solar system, of a planet, of an organism, even to the social and moral progress of a nation. In this is found the "unification of all sciences," which Spencer regards as the problem of philosophy. Spencer, without noticing it, enters on the same courses as were followed by the German nature-philosophy of Schelling and Hegel, and differs from the latter only by his greater respect for facts, and his incomparably more exact positive knowledge. His law of development is merely a play with analogies, or at best a mere schematic formula, which does not come in contact with phenomena to explain them, but only describes a superficial similarity between different kinds of natural processes. Every concentration of motion—which results in a corresponding dissipation of motion, *i.e.*, in a loss of motion for the system in question—Herbert Spencer calls development, which is a mere figure of speech outside organic nature. He asserts that a homogeneous state is necessarily unstable,

although for purely mechanical reasons, the more homogeneous it is, the more stable it must be. He regards development as the transition from a homogeneous and unstable state to one heterogeneous and stable; a process which is conditioned by the concentration of matter, and the dissipation of motion. What is merely an abstraction and very far from concrete reality, is treated as an ultimate cause. Or what true relation could exist between the concentration of energy by which the solar system is thought to have originated, and the growth of separate organs which "progresses *pari passu* with the growth of every organism"? The very simile for both processes, not to speak of the processes themselves, is different, for an organ requires additional matter in order to grow, while, on the other hand, the planetary system is formed by internal subdivisions of the gaseous mass. And if increase in population in a country can be compared with progress in the concentration of matter, how about the dissipation of energy which the law of development demands? For the inner activity of the social system seems rather to increase with the increased density of population. Spencer does indeed say that as the parts are brought closer together, their connection becomes greater, and reciprocal dependence more close. But what does such integration mean with reference to aggregated parts of matter? We are dealing with pure figures of speech and more or less veiled similes, just as in the philosophy of Hegel.¹

¹ In contesting Spencer's universal law of development, I am very far from the desire to contest his services with reference to the biological law of development; but I must remark incidentally that the general views of Spencer and of Darwin as to development in organic nature, do not agree, but are essentially opposite. Spencer treats development as a law; Darwin as a result of laws. If development itself were a law, it would be superfluous and nonsensical to seek for laws governing development, when this is itself the highest and most universal law of all nature, not merely of organic nature. Spencer treats progress as necessary, constant, un-

§ 9. By comparing different concepts, in order to unite common features in an abstract expression, we never reach a concept with new content. By comparing natural laws, and logically abstracting the common element in them, we reach no new law of nature, but only a name for a class, a short verbal description for laws already known without this name, and indeed known more exactly than by it. Metaphysical generalisation was on the wrong track in attempting to reach the highest all-embracing laws of nature, or the most universal conceptions of being, by omitting certain characteristics.

Subsumption, which metaphysics uses instead of deduction, as well as abstraction and analogy, must appear insufficient to generalise and extend concepts, if we compare it with the method of deduction recognised and used by science.

Metaphysics does indeed regard this deductive method as its own excellence. But we must contest the truth of this, for we can show that there is no more similarity

avoidable; Darwin finds no general tendency to progress in organic nature; the same causes which ordinarily result in progress for the organisation, in other cases *simplify* it retrogressively, while in other cases they condition the stability of the organisation. Darwin uses Spencer's law of development to explain the origin of the first complex organisms from those of one cell. But this is inconsistent, and is suggested as a doubtful matter. A true law of nature cannot hold for one exceptional case, it must apply to all similar cases. If there really exists a tendency to go from a homogeneous into a differentiated state, a tendency to perfection, what need is there of farther principles to explain progressive organisation? Briefly, Spencer's general law of development is nothing but the well-known *nisus formativus* transferred to nature as a whole. His theory is metaphysical in that meaning of the word which denotes an antithesis to true science or philosophy of nature.

The attempt to apply this law of development to the social and moral states of man seems most astray. According to Spencer's view, society must progress by reason of the general law of development, without any aid from man; the decisions and actions of man may delay or hasten this progress, but cannot prevent it. But the purely natural and the moral form no such continuous series that the laws of the former sphere may be immediately transferred to the phenomena of the second; and if the old proverb "*natura nihil facit per saltum*" is false when understood absolutely, it is certainly false in reference to the divergence between moral and purely natural development.

between metaphysical and scientific deduction, than there is between the metaphysical method of enlarging concepts and that employed by mathematics and natural science. The strong prejudice against deduction on the part of positive science is due to a confusion of scientific deduction with metaphysical. In fact, the two are as unlike as the Aristotelian induction and that of Newton.

There is a growing conviction that induction and deduction are not antithetic methods, but only different directions of one and the same method; that the introduction of a hypothesis, much more the explanation of a natural phenomenon, would be impossible without deduction. We distinguish more definitely than formerly the inductive explanation of phenomena from the generalisation of this explanation, and we should hardly be inclined to treat Mill's definition as more than a description of the latter process. ("Induction is the process by which we conclude that what is true of certain individuals of a class is true of the whole class, or that what is true at certain times will be true in similar circumstances at all times," Logic III. ii. 1.) Inasmuch as this distinction, though evident and important, is less widely recognised than the fact that induction and deduction belong together, I may devote a few words to it. Every inductive explanation is based on the principle of sufficient reason, or one may say, on the conceivability of events. This principle would be valid, the explanation of a phenomenon from its immediate antecedents would be possible, even if no single case were exactly like another, if there were in nature no repetition of sufficiently similar phenomena. The method of generalisation, however, is based on the assumption that there is not merely causality, but *like* causality in nature, that completely parallel cases occur. This method must not be confused with the extension of

concepts by introducing connecting facts, which has already been discussed. The assumption on which generalisation rests, like the principle used in the explanation of nature, expresses, on the one hand, a demand of our thought; on the other hand, a fact universally confirmed by experience. But it is necessary to arrange experience properly, in order that it may confirm the demand of thought. Cases which in nature are never exactly alike, nor recurring under exactly similar conditions, we must make alike; and from this it is evident that science does not arise by merely receiving and comparing perceptions, but by working over experience, by producing new perceptions under chosen conditions adapted and arranged to test our theoretic assumptions. In the *praxis* of science, we have long been wont to examine phenomena under simplified or general conditions, so that in generalisation we are only conscious of a particular act of thought added to the explanation. Still, no student of chemistry believes that these generalisations must be valid beyond certain attainable limits of temperature, pressure, &c. In mathematics, and only here, do demonstration and generalisation of a proposition (not the generalisation *by extension* before mentioned) coincide; and here the converse of a proposition, by which it becomes reciprocally universal, must be proved independently. Physical science can never dispense with the proof that an explanation may be generalised. The principle of this proof is analogous to the principle which governs generalisations in geometry. Though we demonstrate a proposition of the triangle with reference to a particular triangle, the demonstration holds universally, because it is independent of the particular characteristics of the figure, the length of the sides, the position of the triangle in space, &c. Such an independence of particular conditions which is recognised in geometry without experiment, must be reached by

experiment in the case of propositions in physical science.

Setting aside the preparatory deduction in proposing a scientific hypothesis, we may distinguish three general cases of deduction. The simplest deals with the application of a law of nature to a special case, *i.e.*, a case under special circumstances not foreseen in the law. One step in Newton's wonderful proof of the theory of gravitation may serve as an example of such deduction. Newton applied the law of accelerated fall to the centripetal motion of the moon, and computed the amount of its deviation from the tangent of its course on the basis that attraction decreases with the square of the distance. The second class includes deductions of a new universal fact from a law previously known or correctly assumed. So from the principle that acceleration of fall is independent of weight and material, we conclude that in empty space all bodies fall with the same velocity. Thirdly, the law governing a particular phenomenon may be deduced by combining known laws. So we may predict the rise of mercury in the Torricellian tube by combining known hydrostatic and hydro-dynamic laws with reference to the weight of air.¹ All scientific deductions may, I believe, be reduced to one of these three forms. At the same time, they prove—most evidently in our third case—that real progress in knowledge may be reached deductively. The real deductions must lead to something new, something not before known.

But where can we find in metaphysics an inference corresponding to one of these scientific deductions? Metaphysics knows only the syllogistic deduction. The

¹ This example from Mill is given by Rau, *Die Theorien der modernen Chemie*. Rau also analyses an even more instructive but technical example, Kolbe's deduction of secondary and tertiary alcohols. Rau misuses a fixed philosophical term in calling this "deduction of synthetic knowledge *a priori*."

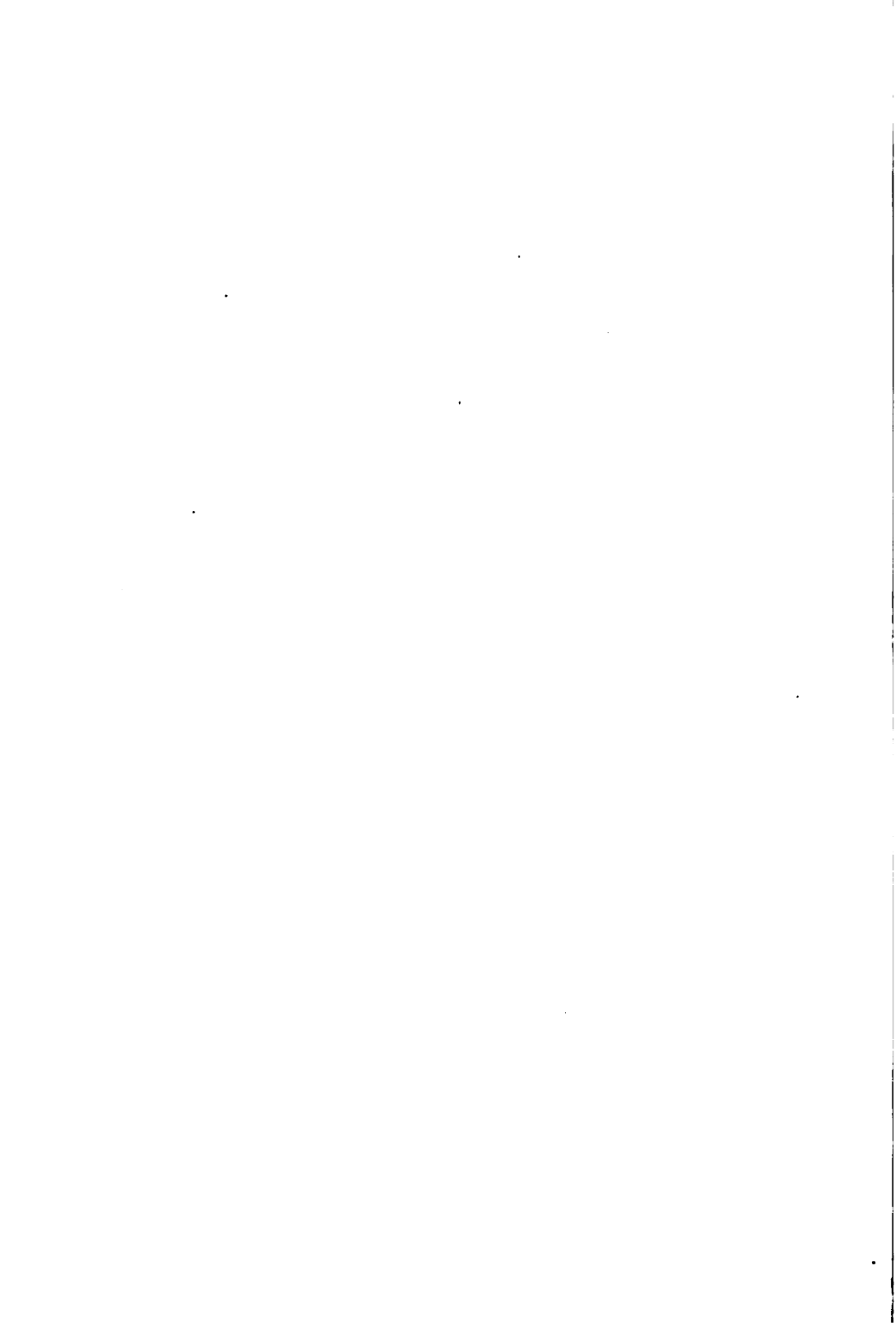
syllogism is, indeed, a means of testing the formal correctness of an argument. Practice in syllogisms may be very useful to prevent carelessness in thought; but since Bacon, Descartes, Locke, and Mill, there can be no question that the syllogism is not a real deduction, as it leads to nothing new. The distribution of phenomena, according to classes of concepts, cannot be called deduction, unless one starts, as did Aristotle, by assuming a system of real concepts. It is undoubtedly true that scientific induction was not known in Greece, and this involves lack of acquaintance with deduction as used by science.¹ Induction and deduction may be distinguished, but not separated.

So we find that metaphysics as compared with science shows an antiquated type of thought, both in its conception of the objects of systematic investigation, and in the method by which its systems are formed. There is only one kind of system that is not merely provisory and intended to fill the gap between spheres of knowledge not yet connected, namely, that system which advances with the progress of exact science, to which are due the mechanics of heat, and the theory of descent, which has no limit to its extent and depth, but is constantly encroaching on the ground of metaphysical systems.

We regard the conviction that metaphysical systems are impossible as one of the most important results of the general theory of science. It prevents further waste of mental power on problems that are insoluble, because wrongly stated. But, at the same time, it opens new lines for scientific investigation. The knowledge that science and theoretical philosophy (the general theory of knowledge excepted) are one and the same, that there is only one system of knowledge, not two, gives an essentially higher goal to science. On the basis of this knowledge, science, conscious of its philosophic vocation, will

¹ This is true of ancient philosophers also, Archimedes excepted.

perform its systematising task. In its field of labour it will see no goal, but rather the means necessary to reach its goal—the synthesis of knowledge. Investigation of details will no longer be so over-estimated as when science, unconscious of its highest problem, left this to metaphysics. To make science itself philosophy, is the philosophic problem of our day ; the highest, most inclusive problem which can ever be proposed in the sphere of knowledge.



PART II.

PROBLEMS OF METAPHYSICS.

CHAPTER I.

REALITY OF THE EXTERNAL WORLD, AND IDEALISTIC THEORIES.

§ 1. THE meaning of all knowledge rests on the conviction that by it we can discover an order of things already existing.—Given no sun, and no planets, except in the idea of men, the contest for or against the Copernican system would turn upon a comparatively unimportant thing, the more or less simple arrangement of astronomical equations. The heroism of Giordano Bruno, who died for a new theory of the world, must seem to us now but folly, if that idealistic wisdom were correct which denies the existence of planets outside the mind of man. Indeed, what would be left of investigation, if there were no world of things on which consciousness depends in perception, to which experience conforms in all its elements and in the definite relations of its elements—a common world for like knowing beings? The mere agreement of ideas with each other, a play of the mind, could only satisfy a purely subjective interest. Even the agreement of one's own thoughts with the thoughts of other men, by which these get a universal validity, is only possible by a real, not merely imagined bond between thinking subjects; the thought is only communicable when spoken, when it has become sound and word. Realism is the very basis of logic; so much the more is it the basis of positive investigation and science.

There are natural errors to which the mind is exposed, as it is a practical faculty, designed to direct actions.

Only gradually does the knowing consciousness get its bearings in the world of objects. Every extension of knowledge necessarily exposes the error of the more limited standpoint before assumed. At the same time, it gives the reason why we must assume it. Such a disillusion on a large scale was wrought by Copernicus, when he transformed not the heavens, but the ordinary idea of the heavens. But at the same time he revealed the reason why the true motions of the heavenly bodies had so long been misunderstood. If he had not found a starting-point for his new view in the experience that the same phenomena of motion may recur under entirely different actual relations of bodies, this view would have remained beyond comprehension, and certainly would not have been propounded. Does perhaps the conviction that the external world is real, that things and changes are independent of the consciousness that perceives and thinks them, belong to those false presuppositions of the mind which at length are rectified by experience? Can we find in experience starting-points for the idealistic hypothesis which doubts or denies the independent existence of things?

We are inclined to think that things exactly like our perceptions exist outside of perception. Uncritical thought does not at all distinguish perception from thing; it regards the phenomenon of an external cause, its effect on sense and mind, as the external cause itself. But even if this belief, which suffices for the practical ends of life, does involve an error as to the character of things, it need not therefore be in error as to the existence of things. Between the assertion:—things are like our ideas, and the assertion:—they exist outside of thought and independent of it, there is no so necessary connection that the refutation of one involves the refutation of the other. As astronomy does not destroy the reality of motion by distinguishing between real and apparent motion, so the critical philosophy does not imperil the

existence of things by teaching that phenomena of things and things themselves are to be distinguished. Even Kant remarked that the existence of the material world is not ended, if one finds that all qualities which form the idea of a body belong to its phenomenal appearance.¹ Existence does not belong to the content of any representative idea; it expresses the connection of the thing with our consciousness, the relation in which it stands to our consciousness through the stimulation of our sense. But that which can affect our sense, proves thereby its independence of sense. And that which can affect sense, is able also to affect other things than sense, and this effect appears in the change experienced by our perception of those things. On the idealistic side, the two questions as to the existence and the knowableness of things are continually intermingled, and the existence of objects is not distinguished from their existence as objects.

If we start with dreams to prove an idealistic hypothesis, we forget that the first question is whether we could dream without a body, and whether the external world is absolutely, and in every way, non-existent for the dreamer. But this proof can only succeed, if idealism, the theory that the external world is unreal, is presupposed; and with this presupposition, it is superfluous. Which comes first, waking or dreaming? And why is waking life compared with dreaming, instead of treating the dream as the imperfect disconnected waking life that it really is? The idealistic hypothesis must be accepted before dreaming can be regarded as a confirmation of it. Dream and hallucination start with abnormally stimulated (Meynert says, subcortically stimulated) impressions of sense. With these automatic stimulations, doubtless caused by increased flow of blood to the brain,² are associated normal sense impressions from the periphery,

¹ *Prolegomena*, p. 46.

² Mosso, *Diagnostik des Pulses*, Leipzig, 1879.

sensations of pressure, change of position of the body, sensations of sound, or even of light. Mosso has proved by experiments on the changes in circulation (by measuring the varying volume of the arm), that external stimuli continue to affect the sense of one sleeping. No wonder, then, that the images in dreams are so like perceptions in a waking state. Their similarity rests on similarity of causes; the difference, on difference of these causes. The dream is by no means unimportant for the theory of knowledge, though it cannot at all establish idealism. It shows us what part sense and consciousness have in forming our idea of the world. Still, this must not be over-estimated. We cannot speak of a spontaneous generation of sensations as idealism demands. What does not reach sense and brain in some way or other, by peripheral or central stimulation, is not felt. The real processes preceding the genesis of a definite sensation, the existence of which we can prove to ourselves, because we have several senses, *i.e.*, the conditions for observing the sensations of one sense by means of perceptions of a second, and for establishing the same by experiment,—these are not lacking in the dream, or even in hallucination. The illusion of dreams never concerns sensation itself. It is impossible to imagine that one perceives. This depends entirely on a false evaluation of sensation-materials, on incorrect interpretation of the same, which is due to a lowering of activity in the cortical substance, in favour of subcortical parts. I repeat, the dream is abnormal disconnected waking life, characterised especially by lack of memory, forgetfulness as to certain experiences.¹

Sense-deceptions furnish no better proof of idealism than do dreams. He who talks of sense-deceptions thereby admits that the senses do not always deceive, else any distinction between deception and truth would

¹ Stricker, *Vorles. über allgem. und experim. Pathologie*, citirt von Exner, *Hermann's Handbuch der Physiologie*, vol. ii. p. 294.

disappear. Finally, as has been already shown, the so-called deceptions are to be treated as results of the adaptation of sense-functions to the normal relations of the sense-world, which includes the senses themselves, so that this is an argument for reality, not against it.

In sense-experience no starting-point for the idealistic hypothesis can be found. It cannot be confirmed by dreams, nor can the external world be treated as a universal and continuous sense-deception. The only possible course is to illustrate and prove this idealistic view (fundamental view, Schopenhauer terms it) by certain general considerations.

These considerations can only be tested after a review of idealistic theories, and a statement of the motives leading to them. The general conception of idealism includes so different theories as Berkeley's spiritualism and the so-called positivism of to-day. In attacking idealism one must never forget how much it has stimulated the investigation of our knowledge of the external world; in the form of doubt and questioning, as presented by Descartes and Hume, idealism is both correct and useful—it leads to the criticism of knowledge.

§ 2. Even in ancient philosophy the fundamental problem of the theory of knowledge, the question as to the relation of ideal and real, received due consideration; and it is instructive to see how even then philosophy was driven to an idealistic result from standpoints exactly opposite. On the one hand, Plato and Parmenides apply to reality as a measure the normative concepts of reason, and because they find the true and complete reality in these concepts (called ideas by Plato), the phenomenal world must become for them an illusion. According to Parmenides, it exists only in the mind of mortals; according to Plato, it is real as far as it has part in Ideas. For Parmenides, the ontological standpoint prevails as the standard of reality; for Plato, the ethical and æsthetic norm goes with the ontological, so that the resulting

conception is broader and richer. But both thinkers agree in treating "being" as an attributive, predicative conception, to be connected with certain subjects, and not with others. And inasmuch as they presuppose that being involves likeness with itself, unchangeableness and simplicity (Plato adds purity, homogeneity, and absence of form), they arrive at the conclusion that "being" cannot be predicated of the changing world of phenomena and activity. The result is an antithesis between the sense-world and an intelligible world, which last is equivalent to pure thought. Matter, the cause of non-being and transience for things of sense, Plato sets in antithesis to the "Idea," which alone is truly real. It is indeed more than a mode of imaginative thought, for it has universality. It is the conception of physical phenomena as such, and therefore, like the Idea, it is recognised as the one, the common element of phenomena, by abstraction from them. This process of inference, identical in form with the inference giving the Idea, in this single case leads to something without being and void, rather than real and actual. So Plato calls this inference to matter, a corrupt inference. On the other hand, as Plato and Aristotle indicate, the Sophists were obliged to extend their principle of the relativity and subjectivity of knowledge to the very existence of the external world (though only for the sake of discussion); and in so doing they used the most popular argument which modern sceptical idealism has attempted to employ, namely, reference to the dream.¹ Greece has already

¹ Plato, *Theætet*, p. 158:—"Socrates asks, Do you know that there is a question which is raised about all these errors, and especially about waking and sleeping? How can you prove whether at this moment we are sleeping, and all our thoughts are a dream; or whether we are awake, and talking to one another in the waking state? *Theæt.* Indeed, Socrates, I do not know how you can prove that the one is any more true than the other, for all the phenomena correspond; and there is no difficulty in supposing that we have now been talking to one another in our sleep; and when in a dream we seem to be telling thoughts which are only dreams, the resemblance of the two states is quite astonishing. *Socr.* You see, then, that there is no difficulty in raising a doubt, since there may even be

furnished the proof that idealism can be reached both by over-estimating, and by neglecting the reach of the categories. The same antithesis between rationalistic and empirical idealism may also be traced in modern philosophy.

Berkeley in the second, less-known phase of his theory,¹ Fichte, and in one way Schopenhauer himself, a doubt whether we are awake or in a dream." (From Jowett's translation.)

It is interesting to note how Aristotle met the attacks of the Sophists on the reality of the external world. "Now, doubts of such a sort as this are similar to one's doubting whether we now sleep or are awake. For all such doubts amount to the same thing; for these persons demand that there should be a reason of all things. They seek for a first principle, and expect to obtain this by demonstration, whereas that they are not persuaded of the validity of their position they make manifest in their acts. Dreaming and waking are different enough to be distinguished in their results." "For no one, even if in his sleep he supposes that he were in Athens when he is in Libya, starts to go to the Odeion. They, however, who only aim to overcome an opponent with words, seek something impossible. They demand that one show them contradictions, while they begin by making the contradictions their principle. . . . They are obliged to treat everything as relative, everything as matter of opinion and perception, so that nothing has happened or will happen, unless some one has previously thought. . . . If everything exists only by virtue of its connection with the thinker, then the thinker—and the thought—were in kind an infinitely many." "In general, if only that perceived by sense exists, nothing would exist unless there were beings with minds, for there would be no sense perception. This latter (that in this case there would be no sense perception) is indeed true; but that the substrata producing sense perception would cease to exist is impossible, even if there be no perception. For perception is not perception of itself, but it presupposes something else which necessarily precedes it." (*Metaphysica*, IV., chaps. v. and vi.).

In these remarks there is scarcely an argument which cannot be used to-day against idealistic scepticism. Aristotle points out that perception itself involves relation to something outside itself. He shows that all proof as mediated knowledge must have its limit in some immediate knowledge—as such he regarded the principle of non-contradiction—"the principle of proof is not proof itself." It follows that the impossibility of proving the existence of the external world, i.e., of deducing it from a principle which does not presuppose or include its existence, can never be reason for asserting its non-existence. Farther, Aristotle perceives that a man's real faith is not necessarily that which he declares to himself or others that he believes, but is rather to be learned from his actions. Finally, Aristotle's description of those idealistic dialecticians who want to overcome their opponents with words, agrees still with the artificial attempt of certain idealists to cast the burden of proof on their opponents by asking them to find contradictions in the idealistic hypothesis, as if any chance belief were true which involved no contradictions. It is just as certain that the non-existence of a fact cannot be proved by the absence of contradiction in the thought of its non-existence, as that its existence cannot be proved by the principle of non-contradiction.

¹ Cf. *Siris*, a chain of philosophical reflections and inquiries, with the

belong to the "Platonising" phase of idealism, while the sophistic doubt as to the reality of things finds its counterpart in the pure empiricism and a so-called positivism of the present. Berkeley in the first phase of his philosophy, and Hume in his early "Treatise of Human Nature," prepared the way for this phase of idealism. Hume properly belongs in connection with the critical rather than the idealistic philosophy, but in this work he followed Berkeley's argument against the existence of the material world more than was necessary. For Descartes, idealism formed but a transitional stage of method, as it were the transition through the imaginary to the rational.

Kant's distinction between problematic (sceptical) and dogmatic idealism concerns only the degree of caution in making the idealistic denial of external existence, not the antithesis of reasons given for the strange assertion. In this connection his antithesis of formal and material idealism must be mentioned. Formal idealism, Kant's own view, is based on the ideality of space and time as forms of intuition, or more exactly on the ideality of space as the form of sense intuition, for idealism is concerned with the reality of the external world. This ideality of space involves in Kant's estimation the reality of things which are perceived immediately as external phenomena, as phenomena in space, and it should therefore remove the ground for sceptical, and so much the more for dogmatic idealism. Material idealism, on the other hand, whether it appears as sceptical or dogmatic, is the theory that things are merely ideas in the mind of man. The two sorts of idealism assert essentially the opposite: formal idealism that space, time, and the

editor's preface. Works of Berkeley, ed. Fraser, Vol. II. pp. 479; and 350:—
 "Here the phenomenal Nominalism, for which the early philosophy of Berkeley has been celebrated, is modified and supplemented by a Platonic or transcendental Realism." Kant's proposition was correct:—"All pure idealism from the Eleatic school down to Bishop Berkeley is covered by the formula: all knowledge by sense and by experience is mere illusion; only in the ideas of the pure understanding and of the reason is truth."
 (Proleg. p. 154.)

categories are in themselves only ideas ; material idealism that the things which appear phenomenally and are thought in these forms are nothing but ideas. For this very reason, it is incorrect to term Kant's teaching idealism.

If we ask for the motives which produce doubt or denial of external reality, we find them not so much in certain difficulties or apparent contradictions of the realistic assumptions, as in misunderstood demands of our higher spiritual nature, which we think can never be satisfied by the world of phenomena. In many cases the true source of theoretical denial of the world is to be found in some form of practical renouncement of the world, and as Plato's example shows, practical idealism has more than its name in common with theoretical idealism. Belief in the ideal as the end of action may easily lead to unbelief in the real ; and Kant is not incorrect in his conjecture that fanciful and even mystical purposes underlie the genuine idealism which denies the existence of "things." True practical wisdom does indeed exclude every visionary attitude toward reality. But it is certainly more attractive "to build in one's bosom" a world more beautiful and more complete than the world of reality, and to explain the real world as a dream, often an oppressive dream, than to carry through one's effort toward the ideal in severe battle with things as they are. It is just this apparent natural connection between belief in the ideal of action, and the renouncement or minimising of reality, which gives Platonic idealism its power over the mind, and lends it that metaphysical charm which not rarely has dazzled noble spirits.

Religious motives combine with moral in support of idealism. If the world is regarded as emanating from a spiritual principle, it is only one step more (a step taken in India) to treat it as a phenomenon without being, a deception of the senses—though, indeed a

deception of senses themselves imagined. Reason is interested to escape from dualism, be it of God and the world, or of soul and body; and this interest seems best satisfied by the theoretical idealism which at once transforms the present into the beyond, the material world into a spiritual world.

Berkeley was certainly influenced more by religious motives in forming his anti-materialistic hypothesis than by the consequences which he thought he must draw from Locke's philosophy. "Matter being once expelled out of nature," he writes, "drags with it so many sceptical and impious notions." But really it "drags" with it much else, of which the pious philosopher cannot have taken earnest thought. Unquestionably, as Berkeley claims, the difficulty of the resurrection disappears if the body only exists in imagination. But does not the miracle of the resurrection also disappear? And what is to become of the miracles of the Bible, what of creation, if matter be but an imagination of mind? Is it permissible for the believer to interpret the account in Genesis as idealistic, and to assert that man was created before the earth on which he dwells? The unbeliever may oftener refer to matter, but it is certain that faith cannot dispense with it. Fichte considers the external world real, only so far as it is the medium through which duty is realised. The practical reason is all that makes possible the theoretical reason with its whole content. In the "Basis of Natural Right" one may see how the philosopher deduces the world from the conceptions of right, and even deduces the existence of one's fellow-men from the conception of reasonable action, *i.e.*, this is made a result of faith in the ideal of action, though it is evident that reasonable action can only exist when men are first united in social life. In reference to such a distinguished philosophy, it is scarcely permissible to say that the particular contents of theoretical experience, when deduced from the

practical reason, do not harmonise. But if the world is only an allegory of morals, if it has only moral and not physical existence, it must bear the stamp of its origin in all phenomena from the least to the greatest. Now in a general way it may be made conceivable that fellow-men must exist, or be assumed as existing, in order that right and morals be possible, even for thought; it may be made conceivable that the ego needs the idea of an articulated body even to appear to "act," and that this body demands light to see, air and food for preservation (all this in idea merely); but how does the existence of poisons agree with this remarkable deduction, or how is the existence of beasts of prey to be explained, beasts that may sometimes feed on the ego, subject of duty and of reasonable action, skin, hair and all? Does this result from the single reality recognised by Fichte, from action with reference to one's self? Finally, in the development of Schopenhauer's philosophy, idealism is preceded by pessimism. The earliest remains of this remarkable man, which Gwinner has collected in his biography, show that his pessimistic view of the world was fixed long before it made place for itself by idealism. Schopenhauer found the thought unendurable that this being which alone we experience, should be the final and single reality. So he took refuge in idealism; so, after he had become acquainted with Kant's teaching, he understood this as idealistic, although it is undoubtedly realistic in reference to the fundamental point, namely, the existence of objects independently of the consciousness to which they appear. Pessimism is the guiding idea, so to speak, the innate conception in Schopenhauer's philosophy. Because the world is miserable through and through, because existence is unhappy and out of joint, its principle must be blind will, an impulse never ceasing and never to be satisfied. And because all longing can be satisfied, and total emancipation from effort be found only in what is not the world, therefore there must be a

possibility of escaping out of the world by merely reversing the will; this again presupposes that the world is only a dream, which disappears of itself with the denial of will, with the awakening of a "better consciousness" as it was earlier called. So pessimism is the only unifying and original motive in a philosophy, the different elements of which otherwise lack connection. Schopenhauer's philosophy is pessimistic idealism, an idealism springing out of pessimism. We have no desire to overlook entirely this question as to the worth of existence which Schopenhauer has opened and answered negatively, but undoubtedly it only gains its full earnestness, its full impressiveness, when we start from the realistic hypothesis, instead of from idealism. The theory of actual existence is not only the basis of science and logic, as it was termed above: it is the basis of a truly practical philosophy.

§ 3. There are two classes of general arguments advanced in proof of idealistic hypotheses. First, the phenomenon is decomposed, and by subtracting everything in it which is thought to be subjective, sensation, and form of intuition, it is made to disappear before one's eyes, as it were. Hume himself did not fail to notice that in this way the relation of the thing itself to consciousness still remains; and just as all manner of metaphysical speculations about a noumenal world start with this relation, so there may be based on it, and with very different right, the conviction that things exist. Let not the word transcendence decide against this, for the only question is whether we transcend with or without reason. Finally, we need not go outside our own consciousness, which alone is immediately given, to touch the limits that bound it. That relative idea which we form of objects outside us, *i.e.*, different from us, when we "go as far as possible with our conception of the object," is by no means so empty and incomplete that, as Hume thought, no sceptic need trouble himself

about it. Only the thought of relation (of *something* to our consciousness), is abstract, and so far indeterminate; the relation itself is as manifold and as determinate as are the sensations and groups of sensations affecting consciousness. These determinate relations change as often as we move, or turn the eye, or vary our position. They change just as frequently without purpose of our own and against our will, but the thought of the relation remains ever the same. The difference and manifoldness of the relation of objects cannot be deduced from the mere homogeneous thought of the relation. And if we are to know nothing of objects except these determinations of relation, yet from these we know enough of them to distinguish existence from representation in thought, existence of objects from existence merely as an object. Our knowledge of objects may be always relation; our certainty of their existence is absolute and immediate.

The second class of arguments for idealism may be termed ontological, inasmuch as it makes the being of things dependent on their being thought, *i.e.*, like ontology, it makes thought the measure of being. In short, it seeks to prove a contradiction in realism, by attributing to it the nonsensical effort to think things that are not thought.

Things to be different from, and independent of consciousness, must be things existing outside of consciousness,—so the claim is made. Now nothing is immediately given except consciousness and the ideas in it; and far as I may extend my ideas in thought or in the process of perception, I can never get out of my consciousness, and reach things themselves; therefore the existence of such things is at least uncertain. It is moreover unthinkable, *i.e.*, the thought of their existence involves a contradiction. For to think the existence of things outside my consciousness, I must think them; they are *thought* things, and their existence is by no means independent of my consciousness.

He who ascribes any value to that argument is deceived by inappropriate figurative expressions. Things are not outside consciousness, nor are thoughts in it. Consciousness is a function connected with the appearance of things, not a place where either a thing, or the idea of a thing, may be. As the conception of force involves the reciprocal relation of two bodies to each other, so consciousness involves the relation to something different from itself, the object, and it disappears as soon as this connection is set aside or broken. It certainly is not contradictory to any category of our thinking to assume that the same thing which becomes object by entering into the relation which gives consciousness, exists also independently of this consciousness. Indeed, this assumption is necessarily connected with the thought of relation. What does not exist, cannot enter into relation with anything, and what enters into a relation, must have independent existence. The relative existence of things as objects of consciousness presupposes absolute existence (existence independent of this relation). It is unquestionably true that I bring everything which I think into connection with consciousness in thought, and inasmuch as I abstract from my own individuality in thinking, into connection with a consciousness in general. It does not result from this that everything must actually stand in relation with my consciousness, or some consciousness, nor that any object is actually present to the consciousness because it relates to itself the conception of an object. The fact is not to be overlooked that that universal consciousness with which in thought I unite any object at will, is only a thought consciousness, logical and not psychological or real. Sensation and perception, not mere thought, are necessary that an object be really present. The pure form of relation, object-subject, is, like every purely formal thought, entirely unlimited, a logical infinite in Dühring's terminology. But this unlimited thought, applicable at will, is limited in sensation.

Thoughts do not stimulate sense. I cannot properly say that I think being. For being is not an element of any idea, it is perceived, felt, experienced—not imagined nor thought. So in regard to the existence of things, we find ourselves thrown back on sense experience, which, as has been shown, offers no starting-point for the idealistic hypothesis. In perception, our consciousness feels itself dependent on the presence and activity of that which we represent and think as object. The thought that the existence of things is independent of our idea of them, cannot involve any contradiction, because it is only another expression for the fact that our consciousness is dependent in sensation and in perception.

If idealism calls for the witness of consciousness, which alone is immediately given, it must take its witness complete and unfalsified. The idealistic hypothesis is without foundation. It is neither supported by the facts of sense experience, nor proved by general logical considerations. This result is to be confirmed by the following.

§ 4. The *cogito ergo sum*, the proposition that only one's own being is given immediately with the consciousness of ourselves, while other things can only be reached by conclusion, is always the chief support of idealism. This proposition, often regarded as an axiom, makes inner experience more immediate and more certain than outer experience. As the conclusion from effect to definite cause is uncertain, it always remains at least doubtful whether our sense perception rests on something itself external, something independent of and different from our own being, or whether it is created by some unknown faculty of the mind. I grant the force of this argument. If the existence of the external world is something reached by inference, this inference must share the fate of all empirical conclusions. It may reach a very high grade of philosophical probability, a grade

high enough for the practical ends of life, but it never has the certainty of mathematical proof. That unknown power on which we must ever call, in order to understand the difference between our involuntary and our voluntary ideas, would indeed play the part of a "thing in itself" over against our consciousness of self. Its effect is unlike the activity of which we ourselves are conscious, and often opposed to it. I let my thoughts roam, and a friend opens the door and enters; I am busy writing a letter, and the lamp suddenly goes out. This antithesis between my thoughts and my perceptions proves that the cause of the latter is different from the cause of the former. But the effort is vain to attempt by this fact to prove that both causes do not depend alike on my own being, for I do not know the ultimate causes of my thoughts any better than the causes of my perceptions. Strange as this hypothesis may be, it seems impossible to disprove it. I grant the force of the argument, but dispute its premises.

Even the originator of this celebrated proposition, which many regard as the culmination of modern philosophy, *cogito ergo sum*, gave it two meanings, without noticing the difference between them. In one meaning, it is an existential proposition, and as such it is empirical. I experience that I am as often as I am conscious. My existence is immediately connected with the consciousness of my existence. In its second meaning it involves a proposition in the theory of knowledge, and to this extent it is transcendental, in Kant's terminology. It expresses the necessary unity of consciousness in thinking experience, whatever be the origin of the content of experience, and it is related not to the being but to the cognisability of things. "Thinking" is no longer conceived here as a psychological fact, a process or activity of the subject, but it is taken in its logical universality as norm of knowledge. "Thinking" in this second sense means pure thought;

pure and distinct knowledge like mathematical, according to Descartes; in short, rational knowledge. Descartes constantly confuses these two meanings. Thinking, as the pledge of one's own existence, is empirical thinking, connected with feeling, experience, perception, and will. But that thinking from the nature and constitution of which he infers the nature and constitution of the soul as thinking substance, of matter as extended substance (*i.e.*, substance having only mathematical attributes) is the abstract thinking of the rationalistic philosopher; for this reason it reaches only abstractions—a soul without body, a body without soul. Descartes' dogmatic use of this pure thinking, according to which things are themselves just that, and only that which may be thought of them or known "clearly and distinctly," need not concern us here. The "*cogitare*," which includes all existence, is not mere thought, but thought in that extended use of the word which covers perception also. The existence which is posited by this thought, and only so posited according to Descartes, is the existence of the empirical ego—my personal ego—not of the impersonal transcendental ego, which is first thought through the empirical.¹

¹ Natorp, in his otherwise excellent book, *Descartes' Erkenntnistheorie*, Marburg, 1882, treats Descartes far too much in the sense of the Kantian critical philosophy. He overlooks the fact that existence is only apprehended by the empirical self-consciousness and for the empirical ego, and that the transcendental or pure ego of Descartes is used dogmatically, not critically. Pure thought is to learn the constitution of things themselves, and to prove that the conceptual distinction of soul and body means a real separation of them, and not (as Natorp seeks) a distinction only of the phenomena. The sixth meditation is entitled, *De rerum materialium existentia et reali mentis a corpore distinctione*; and in the appendix to the *Responsio ad Secundas Objectiones* we read: "*Due substantiæ realiter distingui dicuntur, cum unaquæque ex ipsis absque alia potest existere.*" and Prop. IV. gives the proof that soul and body are distinguished really, not simply as phenomena. It was Fichte's error, we may remark, that he overlooked the transcendental-logical meaning of the form of unifying apperception, or of the pure ego, which is reached from the psychological or empirical ego by abstraction of the universe, and then made this form of consciousness an absolute ego (*Ioh an sich*), a metaphysical being. Kant taught that the pure ego does not exist before the empirical ego and independently of this, of which it is the mere thought. For this very reason nothing is known through this ego, for

If we start with the empirical consciousness which alone is immediately given, with the feeling and perceiving consciousness, the consciousness which knows not only its ideas but also its impulses, its efforts, its actions, then Descartes' assertion that only one's own being is given, but the existence of all else reached by conclusion, can no longer be sustained; and instead of *cogito ergo sum*, we must say *cogito ergo sum et est*. Not my self-consciousness, but my consciousness, is originally given; inner experience does not precede outer in time or in thought. A complete indissoluble reciprocity exists between them, and this reciprocity is my consciousness. I cannot apprehend an inner perception as such without distinguishing it from an outer perception, given at the same time with it, and setting it in antithesis to this. We can have no inner experience without at the same time constructing outer experience. In becoming conscious of my own existence, I become conscious of something not myself; the experience *I am* is not simple, but two-sided. The reciprocity of ego and not-ego, of feeling and sense perception, of impulse and hindrance, action and reaction, *this* reciprocity is that which is originally given — consciousness exists, *cogitatio est*. External experience is not inferior to internal in immediateness, certainty or reality. The existence of something outside myself, and different from me, is so far from being an inference from my own existence, that I could know nothing of myself unless there were something external from which I could distinguish myself. Either my own existence is an imagination (I know not whose or whence) or the external world exists as truly as I do! In Descartes' attempt to abstract from the being of objects, and yet to keep the existence of the

knowledge involves both thought and affection of the inner and outer sense. The *I think*, meaning *I know myself as existing*, always involves more than pure thought. It is the expression of the feeling of my existence, and I only know by it that I am, not what I am, and therefore not that I am soul itself thinking, as Descartes taught.

subject (and even of the individual empirical subject!) he abstracts from the single condition under which the subject is, I will not say actual, but thinkable. He removes one element of a correlative conception, without observing that thereby the whole conception is lost.

I have myself admitted that there may be a psychical original state where the distinction of ego and non-ego, self-consciousness and object-consciousness, is still incomplete and inconstant. But if we were to speak of a prevalence of either phase of experience over the other in this primitive state, it is that phase which later becomes external experience, and certainly not that which becomes inner experience in antithesis to outer. By experiences of its own body the child learns to distinguish one group of sensations marked by its constancy and the attendant feeling from other groups, and connects with this the consciousness of its own existence. Subjective experience develops hand in hand with objective; and even in the developed consciousness, objective elements of experience take decided precedence over subjective. Our self-consciousness is thus marked as function of a much more comprehensive reality which exists independently of our thought of it. It was indeed this fact, though veiled in scholastic terminology, which Descartes had in mind when he went from the existence of the ego immediately to the reality of a power infinitely transcending the ego. What he called the conception of God in man's self-consciousness is, scholastic colouring aside, the conception of a reality on which the ego knows itself dependent; and this conception is the outcome of all the conceptions which have preceded clear and distinct self-knowledge. That which limits our effort and opposes our will, thereby proclaims a power equivalent to, and in its totality far superior to our will, the power of what exists outside us. Only because God seemed to Descartes and Berkeley an object better known than the world, does the former base the existence of the world on God's

veracity, and the latter make God Himself the external world.¹

§ 5. The objection might be raised that this very thought of a reciprocal relation of ego and non-ego excludes a reality of things independent of the idea. If subject and object reciprocally demand each other by our presupposition, *i.e.*, arise in one and the same act of consciousness; if the subject as such cannot be thought without an object with which it stands in relation by distinguishing itself from this, and objects are only thinkable in antithesis to a subject; with what right then do we ascribe to the objects of our consciousness an independent existence and reality? We have only escaped that partial idealism which puts subject before object to fall into a total idealism, so it would appear. Granted that the existence of objects is no more a result of inference than is the existence of the subject, that both subject and object possess the same immediateness, still they possess only the immediateness of our own consciousness; they have only represented reality, the reality of representative ideas. Is not consciousness, within which falls this so-called antithesis of subject and object, the common basis of both, and the only reality that we know? While Berkeley taught only that the being of sense objects consists in their being perceived, are not we obliged to go farther and say that we ourselves exist only in representative thought, that our own being is only a represented being? Laas may use the name of positivism to denote this more thorough-going idealism, but the name does not change the fact that it is simply a universal idealism.

This argument must have some appearance of being correct, or it would not have brought so acute a thinker

¹ Berkeley's Treatise, "Of the Principles of Human Knowledge," §§ 147, 148. "We may even assert that the existence of God is far more evidently perceived than the existence of men. . . . We need only open our eyes to see the Sovereign Lord of all things with a more full and clear view than we do any one of our fellow-creatures."

as Laas to his standpoint of universal relativism, a standpoint which has no foundation, but is described by the phrase *instabilis tellus, innabilis unda*. The reality of the object depends on the reality of the subject, and this again presupposes that the object actually exists, as it were the reflection of the image of a mirror in the image of the mirror, and so on. The question what really exists becomes a constant "hither and thither." Kant's proposition that "concepts of relation presuppose absolutely given things, and are impossible without these," puts an end to all this play with relations. Our consciousness, which is always dependent and in fact relative, a periodical phenomenon of life, can never serve as such an absolutely given thing.

It is incorrect to say that the antithesis of subject and object falls within consciousness, for there is no consciousness before and outside of this antithesis, but rather it is itself consciousness. No function can exist without that of which it is a function; therefore, as consciousness is function, there must be something, itself not consciousness, which becomes consciousness. The being of the subject or object is not relative, but its being as subject or as object. "Positivism," or as it is more correctly termed, epistemological monism, takes as its starting-point for the knowledge of things a standpoint about which it must ever revolve. Finally, Laas himself admits that a being not correlative is thinkable.¹ I must assert further that such being is a necessity for thought, because it is already involved in the conception of correlative being. And in addition to this logical consideration, the characteristic attributes of a perception, as distinguished from a mere idea, also make this assertion necessary. The felt dependence of consciousness in perception points to something independent of our consciousness; the determinateness in the modification of our sense points to something determining, which is either an unknown,

¹ *Idealismus und Positivismus*, ii. p. 78.

unconscious power of our own consciousness, or a reality and actuality distinct from our consciousness. Between these it cannot be hard to choose. The assumption of an unconscious creative power of our consciousness does not harmonise with the actual character of the world given in perception. It cannot explain why this unknown power of our mind breaks the course of our thoughts, opposes our will, compels our actions to adapt themselves to it, nor why it produces this effect on other conscious individuals as well as on ourselves. The perception of the external world is a social, not an individual phenomenon. The world is not merely my idea, in so far as I think it, but *our* idea; there is no opportunity to choose between idealism and realism, unless one takes refuge in a pre-established harmony of monads, which breaks any real connection between sensation and thought.

§ 6. Not everything which becomes content of our consciousness assumes the character of a mere representative idea. A feeling is not an idea, will is no process of thought, though we are conscious of each. Inner perception finds a distinction between known and knower, between real and ideal. Sensation and external perception pre-eminently belong to these real elements of consciousness.

Perceptions are more than mere ideas. The real stimulation which we feel as often as we perceive, differs from the memory of the sensation in kind as well as in degree, and this distinction is greater than any other which we can find among the facts of consciousness. The idea of a colour may be ever so vivid, it does not possess the least brightness, such as belongs with the weakest sensation of colour. The idea of a tone has not the least intensity of sound, such as we feel in some degree or other as often as we hear a tone. Hume overlooked this distinction in treating the idea as a weaker perception, the perception as a very vivid idea. To call

perception itself an idea is false terminology, presupposing the idealism that is to be proved. It is necessary first to prove that nothing but ideas could possess reality; then it would go without saying that perceptions are mere ideas, that being which is perceived, is simply being in the idea.

Consciousness of one's self is perception; so also is the consciousness of another object connected with the perception of self. External perception, as has been shown, has the same immediateness as internal. That that which we perceive outside ourselves really exists, is no more a mere imagination or idea than that we ourselves exist only in imagination or in idea.

The subject and the object in perception is phenomenon, not merely representative idea, and phenomenon in that only intelligible sense of the word according to which it includes relation to that which appears. I know my will from the objects toward which it is directed; and even feelings cannot be separated from the perceptions with which they are connected.¹ I know objects only as my sense is stimulated by them. Our knowledge is indeed relative, but only so far as concerns the character of its objects; it is not relative with reference to their existence.

§ 7. A consciousness which existed alone in the world might arrive at the conviction that the external things it

¹ If there is anything decidedly subjective in consciousness, it is feeling. Yet every feeling is related to some element in perception, and is only apprehended in its relation to this, not purely by itself. By this alone we distinguish organic feelings, each of which shows again a qualitative distinction, from the feelings accompanying sensation, which are produced by stimulation of the sense organs, and the lower feelings of sense, from the intellectual feelings. A purely quantitative comparison of feelings is evidently impracticable, even with reference to their specific difference, entirely apart from the fact that there would be no unit of measurement for such comparison. All feelings do indeed move in the antithesis of pleasure and pain; but even if there were no doubt that definite degrees existed in both directions, still every feeling (at least every class of feelings) has in addition a peculiar character, which makes it incomparable with every other feeling (or class of feelings). A feeling cannot be separated from the sensation or idea which occasions it. Love is as different as the objects occasioning it; hate changes with the objects hated.

perceived were real, only supposing that it could reflect on such states. Though the case is a mere supposition, it may be useful to consider it, in order to determine the part of the individual consciousness in knowing the existence of things.

In investigating our reasons for believing in the independent reality of the external world, Hume began by supposing such an isolated consciousness. It scarcely occurred to him that there exists a conscious intercourse of single individuals with each other, and that by this the conviction of the independent reality of things finds constant confirmation and gets its strongest foundation. Hume concluded that belief in the existence of the external world, independently of one's own consciousness, was not to be justified on reasonable grounds. This belief is rather created by a sort of natural instinct, and its effect increased by habit and imagination. But inasmuch as Hume regards reason as a sort of instinct, in so far as its basis is to be sought in the practical needs of life, any failure in proofs of reason need not shake our conviction that things are real. "In vain do we ask, Are things real or not? This is rather a point which, in all our conclusions, must be assumed as proved." Since the existence of the external world in fact is not reached by inference, it cannot be proved; for strictly, proof can only be asked and given for inferences. So far Hume was right. But when he concludes that the mind is imperfect, that there is an antithesis between our practical and our intellectual faculties, because it is impossible to prove an original and immediate knowledge, *i.e.*, to make this at the same time a mediated knowledge, then we must withhold assent.

Hume carefully separates the theoretical question as to the existence of the external world into two elements: —the question as to the continuous existence of things, and as to their existence apart from our perception, and considers that the first question must precede the second.

Bécause we believe in the continued existence of things in accordance with our perception, for this reason we should ascribe to them an existence apart from our perception. The first belief involves the second, in Hume's opinion. This opinion, which affects all Hume's farther investigation, is however incorrect, and its opposite is true. The belief in the continuous existence of things, apart from and independent of our consciousness, is not the original belief connected with every perception. The continuance of objects of perception, after we have ceased to perceive them, is the continuance of the *ideas* of objects as possible perceptions ; and this thought presupposes the continuance of our ego-consciousness. The thought of the continuous existence of objects arises by transferring to external things the continuity of our consciousness, while the conviction of their separate existence is produced by every single perception, and indeed forms the characteristic of perception as such.

Though the individual consciousness can rise to the belief in the continuous existence of objects in the manner indicated by Hume (by repetition of similar perceptions at different times, and especially as the result of changes which things not perceived have meantime experienced), yet this belief receives its confirmation mainly through the common consciousness, which arises in thought-intercourse with our fellow-men. A fire in the stove disappears from my perception as soon as I leave the room, but my friend remaining may still perceive it. The conception of the continuity of an object is a condition of experience, not of mere perception, a condition on which alone perception becomes an element of objective or universally valid kownledge. But the consciousness that objects exist independently of my own existence is given in perception itself. It is the basis of the reality of experience, and, contrary to Hume, precedes the belief in continuous existence. I must first know that the being of objects is different from and

independent of my being, before I can assume that they exist continuously. Only what is independent of my perception, can continue outside of it. In short, existence apart from perception is known from perception itself; continuous existence is presupposed to unify experience.

For this very reason a consciousness conceived as single and isolated may reach the knowledge that external things are independent of it. Let us equip this consciousness with the impulses of self-preservation, with perception and reflection—the capacity to compare perception and idea—and these qualities are enough that it may reach this knowledge. We must direct our attention especially to the active side of psychical life. Simultaneously with the feeling of our effort we get the sensation of limits set to this effort from without, and not by self. The consciousness of a lack, of a need, impels to motions, the execution of which is attended by the feeling of overcoming an obstacle. No limit is more plainly drawn than that between the voluntary and the involuntary in consciousness. The reality of the external world, said Locke, is as certain as our pain and our pleasure, our misery and our happiness. Its certainty is primarily practical; it is not originally drawn from knowledge, but created by action, of which knowledge is the tool. As love and sympathy presuppose the existence of beings like ourselves, as these emotions point beyond ourselves, so hunger and the need of breath point beyond ourselves to food and air, and the reality of the external world may be proved from hunger as well as the existence of our fellow-men from love. It is not necessary for one to go beyond self-consciousness to learn his needs, and the impulse to supply these, as well as his dependence on external objects for the satisfaction of this impulse.

The senses also have, as Rokitsansky remarks, an original tendency to perform their function, an impulse

to stimulation and activity. This tendency of sense-activity finds its confirmation in the pleasure given by sense-perception as such, and more clearly in the feeling of unrest which absence of external stimuli occasions, and of pain when the normal functions of sense are disturbed. A man just blinded feels pain from non-satisfaction of the impulse to see, as keenly as a hungry man who cannot satisfy his desire. The living immediate conviction of the reality of that which satisfies our impulse to perceive, is similar in kind to the hungry man's conviction that he needs real and not imaginary food to satisfy himself, to the conviction of a man who loves and hates, that he does not exist alone. The existence of our fellow-men might as well be disputed—if any one wanted to dispute this—as the existence of the material world.

Our senses are active but not self-active. Their activity needs stimuli to set it in motion. It is related from the beginning to something external, *i.e.*, to something outside us (*præter nos*), even if the external in space (*extra nos*) be, as Kant teaches, the mere form of intuition within us. External perception by itself, then, proves distinctly that something exists independent of my own existence. It is as certain that things exist as that I exist—both rest on the witness of my perception.

§ 8. An assertion, either negative or affirmative, may be attacked in its reasons or its results. After having shown that idealism is a groundless hypothesis, we may undertake indirectly to prove its opposite, realism, by the second method. If an assumption not only is in antithesis to our constant and most natural conviction, if farther we act every moment contrary to it, without becoming conscious of any error, and find that it plunges us into greatest difficulties and involves us in patent inconsistencies when we attempt to explain the commonest phenomena, as is the case with idealism, then every

rule of proof obliges us to reject such an assumption. Even as hypothesis, realism is unquestionably to be preferred to idealism, which is nothing but a hypothesis. How simple is the explanation of the agreement among perceptions of different subjects by realism; what flights into monadological hypotheses and the like must idealism make in order to accommodate this fact to its assumption, if it does not prefer at once to deny the existence of a multiplicity of thinking subjects.

The ego with which idealism starts, the ego which denies the existence of sense things, has no existence, nor is it the real ego, Feuerbach rightly claims. It is an ego which has ideas and thinks, but only imagines that it feels and perceives, loves and hates. By Schopenhauer's simile, it is a winged angel's head without body. According to the physiology of idealists, it is the real function of the organism to have representative ideas; all its other functions—assimilation of food, growth, motion, reproduction—are ideal, and only present through the idea and for it. In the immaterial idealistic world, there is no disease but disease of the mind, no food but food of mind. Whoever believes the existence of sense things to be dependent on his own existence, cannot avoid the consequence that he is not born of his mother, but his mother born of him. If the brain of my fellow-man is only an idea in my mind, how then is it possible that sometimes my idea in another's head is diseased, and compels my fellow-man to all sorts of insane statements? Even relativism, with its constantly vibrating correlation of subject and object, cannot avoid the conclusion that at least the last subject to which he relates the brain as object, must be a brainless subject.

The being of sense things, it is asserted, is their perceptibility; to exist as sense-object means to be and to continue perceptible. This assertion is undoubtedly correct, if perceptibility is understood to be an attribute of existing things in their real or thought relation to a

perceiving sense; but it becomes false as soon as with the idealist one relates it to sense alone. Nor does perceptibility in its correct meaning at all exhaust what we mean by the existence of things. Besides the power to affect our sense, things can affect each other reciprocally. Though we understand the mode of this no better in the second case than in the first, yet we are convinced that it is a fact by the changes occurring in the phenomenal world, independent of the perception of any subject. A fire, starting without being perceived by any one, can destroy a house and those who live in it. The fire must possess other qualities than mere perceptibility. Could a possible perception work such devastation in the world of real perceptions? Has not this so-called possible perception more reality and effect than sometimes even real perception itself?

The causality of phenomena consists in the regularity with which the occurrence of certain phenomena brings with it the occurrence of other definite phenomena. Practical experience, which owes its origin to this regularity, reckons on it; it is the work of theoretical investigation to prove that it is universal and constant, in spite of apparent exceptions. On the assumption that ideas exist by themselves, the course of nature is irregular and puzzling, because every moment ideas depart from the regular course which psychic association marks out for them in accordance with their inner relation. Every glance of the eyes, every sudden sound, breaks the purely internal course of thoughts. Only when we think the subjective world as connected with the objective, and regard perceptions as phenomena of things themselves existing, does the regularity of events become as perfect as the causal principle requires, in order that experience may be possible on the basis of phenomena. The definite consequent B always follows the definite antecedent A; the change of wood to ashes always follows the action of fire. In the idealistic world, however, B may appear

without the antecedence of A ; this is the case as often as we discover ashes without having seen fire. Entire absence of perception of a cause must mean for the idealist complete absence of a cause ; only imagination, the remembrance of cases perceived before, deceives him in regard to a break in the law of causation, which, according to his theory, must have occurred. A cause which is only found in memory, exists only as a thought, and certainly cannot have influenced present perception for it follows this thought of perception. As a thought, this cause did not exist before the effect was perceived ; as perception, it did not exist in the case given ; so that it must have really existed in some other form, namely unperceived, unless the causal connection is to be abandoned. The facts of consciousness only have complete interconnection when they are at the same time connected with external things.

Of the infinite manifold, which every moment affects one, and thus is given for his consciousness, only a very little is given in it ; we are really conscious of only a small vanishing fraction of it. In this respect consciousness is like a country seen from a great distance, so that only single mountain-tops are visible. What has been in consciousness may disappear from it without ceasing to affect it. Because it no longer exists as idea (the assertion of unconscious ideas involves contradiction) and yet continues to be, consciousness cannot be the only reality given in our experience. The fact that conscious states become unconscious, and yet these continue to affect the subject, cannot be denied, because it is confirmed by every case of habit, by every acquirement of a secondary faculty. If then that of which we have immediate knowledge is not the only reality for our consciousness, why should not something outside of it, and not itself conscious (such as we think matter to be), also be real ? Idealism cannot explain the only reality it recognises. The content of consciousness remains for it an aggregate of facts,

inconceivable because disconnected. Every step toward the explanation of these facts undeniably leads beyond the content of consciousness as immediately given. We can be sure of no law in perception, unless the conditions of perception lie outside of consciousness. Idealism is not compatible with the principle of causation, which underlies all knowledge.

§ 9. The facts of consciousness cannot be understood by themselves: it is necessary to assume a reality on which consciousness is dependent. We know consciousness only as a phenomenon of life connected with an organism. We know only conscious individuals whose psychic states depend on organic states in the narrower sense of the word. The unity and connection of psychic states is really not greater, but far less and far more incomplete, than the connection of purely organic states. There is this antithesis between organic and psychical functions, that the former are permanent as long as we live, the latter are intermittent even during life. Consciousness is a periodic phenomenon. Organic life, which we share with plants, has no break during our existence: it is extinguished if any of its processes stop. Conscious life, on the other hand, must perform its functions from time to time; it needs the refreshment of sleep, and shows different degrees of activity when awake. Life does not exist for consciousness, but consciousness (at least originally) for the sake of life. It is an equipment of animal life in its struggle for existence which regulates its relation to the varying conditions of environment. We find it so much the more developed the more complex these relations are; in the case of freely moving animals, more complex than in the case of those that are fixed. We may assume that in the animal world all degrees of connection between psychic states are realised from the transient consciousness which may accompany some movements of accommodation in the lowest animals, Protozoa and Coelenterata, and which disappears as soon

as the movement has attained its end, up to the consciousness of man, which looks backward and forward, but is ever subject to the law of periodicity in psychic life. All this proves that consciousness has no independent existence. Consciousness, though it is immediately given and most closely connected with knowledge, is rather the last and the highest, as such the most mediated, phenomenon.

In reality the "self-perpetuating correlation of subject and object," assumed by Laas, does not exist. So it cannot be the only real, as he asserts. Only in thought is this relation propagated beyond the actual breaks in consciousness. Unconscious and conscious states are joined into the unity of a person on the basis of one and the same individual life. But a mere thought does not bring us into actual contact with any object. It cannot fill the gaps over which it forms a bridge. Laas treats a principle in the theory of knowledge as ontological; what is only a relation in thinking an object, he makes a condition of the object's existence. One may meet this same confusion on the side of idealism.

In order to avoid the inconvenient truth that the individual consciousness is dependent and broken, certain idealists have formed a theory of a consciousness of the race, existing outside and above the consciousness of the individual, the most important bearer of which is the idealist himself. They begin the history, not merely of the world but of the universe, with mankind, and allow themselves the fiction of a consciousness which never originated, which never ends. For this reason the intermittence of their own actual consciousness need not apply to it, and of it they who are born and die can know as little as we. Such a confusion of the transcendental and psychological consciousness demands a clear determination and definition of these conceptions.

§ 10. "Transcendental consciousness" is the form of the unity of consciousness abstracted from its contents,

in so far as this form is thought of as the universal condition, valid not for me alone, to which the idea of every object must conform. A series of impressions, a succession of perceptions does not alone make the consciousness of a single object, or a connected process. Those impressions and perceptions must first be connected, so that consciousness in apprehending them may know itself as one and the same, if the idea of a single object or a continuous process is to arise. The general unity of connection cannot be deduced from the idea of a unified object, because it is itself that which produces the idea of such an object. Though the combination of parts in an object, the connection of the moments in an event, is in its existence independent of consciousness and given to it, yet the idea of the unity and of the connection proceeds from the identity of consciousness in its act of connecting. By treating transcendently this condition of knowing a unified object, I make this condition the universal condition of knowing it; and I can do this because in thought I abstract from the given manifold, and even from the mode of sensation and intuition. Thus arises the conception of a consciousness in general, a mutual consciousness with which the ego continues its actual thought intercourse as an imagined intercourse. To this formally universal consciousness, inner and outer experience is then related: even the perception of existence is connected with it. I think every other consciousness dependent on the very same thing on which my consciousness is dependent, and in the same way, so that my perception, which itself involves reality, obtains also objective meaning. Thinking is really the source of the objectivity of knowledge, because it is the form of its universality. To be objective is to be valid for every knowing being.

It is to be observed carefully that this transcendental consciousness has no existence which is separate, or which can be separated from the psychological consciousness. It

does not exist before the latter, or beside it, but only as thought in it. As the system of co-ordinates to which I relate the sense-intuition of motion passes through my head, so the intellectual system of co-ordinates, to which I relate all knowledge, the transcendental consciousness, is given only in my head. We cannot follow the metaphysician when he makes the transcendental consciousness transcendent, when he makes an absolute ego out of the conception of the unity of consciousness, which conception is, indeed, represented by the ego, but equally well represented by the idea of the unified form of any object.¹

§ 11. From the isolated consciousness which as such could not be the sphere of thought, and which certainly does not exist among men, we turn to the social consciousness, resulting from our intercourse with other men, in order to ascertain its share in the knowledge that the external world is real.

Is it necessary to prove the existence of our fellow-men? This *transcensus* beyond one's own consciousness, even idealists treat as unavoidable and justifiable. With

¹ I take occasion to answer an objection which has been repeatedly raised against the principle of the unity of consciousness as the final basis of experience. Because this principle is not empirically universal, as is proved by disturbances of the ego-consciousness, it is not adapted to be the universal basis of empiricism. Logical universality and empirical persistence are evidently confused here. No one will assert that the unity of consciousness as a fact is constant. Every deep sleep convinces us of the contrary, and it is not necessary even to refer to pathological disturbances (diseases of the personality, Ribot calls them), one case of which I refer to later. It is necessary to show that knowledge and objective experience are possible without unity and continuity of self-consciousness, in order to disprove the proposition that this unity and continuity precede experience as its principle. The transcendental consciousness is not impaired by disease, but only the organs of the psychological consciousness; and if disease of this destroys the ego-connection, the transcendental consciousness, which exists only as thought of the psychological, is thereby annulled, and with it is gone the possibility of objective knowledge. Conditions of knowledge must not be confused with conditions of existence; knowledge presupposes existence. Transcendental philosophy teaches that consciousness must have unity and continuity if experience is to be possible: as often as experience is real, this fundamental condition must be fulfilled. I have already deduced the transcendental consciousness directly from the individual consciousness, while it arises from this mediately, through intercourse with others. This neglect of the social factor in knowledge, I hope to make good in the present volume.

one voice they reject solipsism—though it is not easy to see why a *transcensus*, if such must occur, need stop just at the existence of our fellow-men. Or is it thought that only beings conscious of themselves can exist?

Berkeley, who leaves in doubt the existence of animals, but denies that of plants and inorganic bodies, does not doubt the existence of fellow-men. He calls them *spirits*, their perceptions *ideas*, and asserts that the nature of mind alone is active, and so capable of existence, while the nature of a material thing, or of an idea, is passive, and needs a mind to bring it into being. Is the idea of an animal, especially of a lively, playful young animal, really a passive idea? Does it not every moment prove its own life as independent of our perception? Does not the moving "idea" of a dog compel me to turn my head, to change the position of my body, in order to follow in perception the gambols and leaps of the animal? Had Berkeley been familiar with the fact that vegetable tissue responds to stimulus, and with the observations on insectivorous plants, &c., he would undoubtedly have regarded plants as spirits. But where is the limit of active life and spontaneous activity in nature? There is indeed a definite limit of organic life, but there seems to be no limit for the inner sensitiveness of that which in the totality of its external appearance, its effect on our senses, we call matter. The polar forces determining the formation of a crystal betray a centre of stimulation and attraction. The play of molecular forces, which the physicist finds, is infinitely more varied than even the motions of an animal's body. By far the greater part of motions in nature remain beyond our perception. If Berkeley is right, these motions can have no reality outside our thoughts; and yet many ordinarily invisible motions may be made visible by experiment. An analogous consideration holds true of the invisible parts of a body. Hume found it necessary here to use, not merely the language, but also the thoughts of realism.

If a small body is composed of a far greater number of parts than we recognise in perception, "this mistake," he says, "lies in taking the impressions of those minute objects which appear to the senses, to be equal or nearly equal to the objects."¹ Here Hume correctly distinguishes between impressions and objects of impressions, which elsewhere he confuses.

The difficulties for Berkeley in connection with the wonderful organisation of plants, and the marvellous mechanism of animals, are evident. He can only say, "God always acts according to mechanical laws," which simply means that the animal and plant organisation is superfluous, as the sense organs of man must also be, according to his theory. From Berkeley's standpoint it is absolutely impossible to conceive why God always impresses on our mind the ideas of material things by means of simultaneous or previous modifications of the "ideas" of our senses.

The true object of Berkeley's attack is Descartes' abstract imperfect idea of matter, according to which this is merely an extended something, "which neither acts nor perceives, . . . an inert, insensitive, unknown substance." To regard such abstract matter as real, whether as filling space continuously, or in disconnected atoms, is to believe in the reality of a conception outside one's thinking. As a criticism of Descartes' view of matter, Berkeley's objections still have a certain validity. Yet Berkeley overlooks the meaning of this abstraction as such. By it we seek to reduce the phenomenon of matter to what we can know of it exactly, to subject the science of external nature to a quantitative, mechanical treatment.

In order to prove that only spirits exist, Berkeley and Leibnitz, whose monads are conceived after the pattern of spirits, would have found it necessary first to prove that spirit is really better known than matter, and that everything real must of necessity be a spiritual

¹ "Treatise on Human Nature," Part II. Sect. I, p. 46.

being—in other words, that the conception of a spirit involves analytically the conception of existence. This proof is impossible; this metaphysical question remains to be treated, at least in a subsidiary way, in the following chapter.¹ It is then said that the existence of our fellow-men is reached by inference. This assertion, however, we regard as false. Like every other perception, the perception of a human body immediately involves the existence of that body. To inference could be due only the farther knowledge that what I now perceive is a man, a being which feels, thinks, and wills as I do, which moves at the command of his will, and carries in his mind an idea of himself and of the external world. This conclusion from a perceived outside to a psychical inside is called an inference from analogy. I do not deny that it is in fact an inference from analogy, when finding certain motions in animals that have no central nervous system, or even differentiated organs of sense, we infer that psychic stimuli are present, which have at least a distant relation with our own conscious states. But I question whether it is a mere analogy that makes me believe in the mind of a dog, a creature

¹ Berkeley's empirical idealism has as its reverse side a transcendent, and so dogmatic, realism. While critical realism teaches that what really exists outside us is only known in the mode of sensation and sense intuition possessed by our consciousness, dogmatic realism claims to have an immediate knowledge of it. It knows that the truly real is spirit (or matter).

A spirit which, like Berkeley's divine spirit, impresses on us ideas of material things, only through ideas of sense organs, the affections of which we feel, is related to our consciousness just as if it were material. Berkeley has indeed left it obscure whether he thinks that when several men receive at once the idea of one and the same material thing they perceive but one single idea, or as many separate ideas (i.e., bodies) as there are men receiving the ideas. In the latter case, one house must become a thousand, as often as a thousand men perceive the same house. In the former, the idea persists in the mind of God, even if we do not perceive it. Then this persistent idea is related to every one of us as a real body is related to our senses.

Berkeley teaches that we have no idea of spirit—such idea should always be passive, should be received, and not be thought—but we have a sort of "notion" of something which "perceives, thinks, and wills." Could our conception of matter, as something which moves and is moved, be really any less distinct than *this* notion of spirit? The presence and absence of knowledge is in each case equally great.

with whose emotions I can sympathise; and I have still farther doubts as to the so-called inference to the psychical life of my fellow-men. Clifford has coined the expression *ejective* to denote the apprehension of the psychical interior of another being. And so far as we are dealing with the distinction of this knowledge, from objective perception on the one hand and a subjective inference by analogy on the other, I think the expression good. But there is something more than the withdrawal of self from self, and the introduction of it into another consciousness, which the word *ejective* indicates: there is a true sympathetic sensation of another psychical life. To begin with, a reciprocal connection between one's own consciousness and that of his neighbour is established by the inter-subjective, so-called altruistic feelings. We apprehend the inner life of our fellow-men almost immediately, at least without being first conscious of any transfer beyond ourselves. We distinguish pure sympathy from affected as being immediate. We suffer in another being, and he thereby ceases to be a strange person. We go over at once from the external signs of emotions which we perceive to what they denote. We can hardly think it otherwise than that, perceiving the expression of another's emotion, we should ourselves experience the same. It is difficult to believe that a child can only learn the meaning of its mother's loving smile by a series of personal experiences and an inference from analogy. The knowledge of signs of emotion may rest on experience of ancestors: though I do not assume this, yet to-day it must be innate. However this may be, the mere existence of altruistic feelings within us proves the existence of our fellow-men outside us. These feelings have been developed in social life, so they prove that men must have existed together in a connected community.

I investigate my consciousness, which is all that is given me immediately, and find in it feelings which

point beyond itself to other beings on the same plane. The mere existence of these feelings, which no idealist can deny, immediately involves the existence of other conscious beings like myself. Therefore I do not exist alone.

The objective world is the world of our common perception. We perceive the same parts, or different parts of the same world. What becomes an object for me when it affects my sense, will also become an object for my fellow-men, as soon as it affects their sense, as practical and theoretical intercourse with them teaches us. What ceases to be an object of my perception, has not ceased to be a perceived object for a second or third consciousness. I know that the stars shine while I sleep. The astronomer who is observing them, sees them shine. And it is the same stars which he sees shining and which I believe have been shining during my sleep—even if it be allowed that each one of us bears in his mind, a Leibnitzian monad, his particular starry heaven. So real and possible perceptions combine in the experience of the same common world. A change which I intentionally produce in an object of my perception, makes a corresponding change in what all others present perceive. By handling an object of sense one can prove at once that the distinction between being and representation is real, and that things possess a peculiar nature of their own, which he must learn if his actions are to be effective.

Identity of an object means something more than, something different from similarity in the perceptions of many or of all individuals, it means perception of one and the same thing. The perceptions themselves may vary considerably from each other, as do certain perceptions of animals in contrast with man's, but the thing perceived remains the same; we may know this from the similar practical attitude toward it, in spite of the

dissimilarity of perceptions. An animal turns aside from an obstacle in his way just like a man. A noise I make attracts its attention, just as it causes my friend to look up from his work.

There are two ways of explaining agreement in the perceptions of different subjects, and the possibility of effective common action: the hypothesis of monads proposed by Leibnitz, and the theory of realism, that perceptions are the phenomena of things themselves existing. But the hypothesis of Leibnitz, according to which the conscious states of every being are brought into harmony with the conscious states of every other originally, through no influence of like things, is at variance with the undeniable fact of our consciousness, that there is a specific, not merely a gradual distinction between sensation and thought. Leibnitz sets aside the witness of consciousness, which the idealist least of all can neglect, and makes sensation and perception a mode of thought. His theory is confuted by the very fact that the two are different, apart from the pure assumptions, and even contradictions which it must involve.¹ Realism remains alone in the field, as the only theory according with the facts of consciousness.

Actual things underlie the perceptions of men (and animals) and give them content, and form the material for the action of conscious beings. The agreement of

¹ If all beings are by nature beings with pure thought, they can never arrive at any object of thought. Every monad thinks the thoughts of every other—in different degrees of clearness and distinction—it thinks nothing else. For Leibnitz there is indeed an apparent content for the thinker, through the co-existence of his representative ideas. This content is only apparent. The co-existence of representative ideas, each having only the thinking activity as its object, gives no spatial image. That the monads have "appetite" as well as representative ideas (i.e., the representative faculty) does not concern us here. These desires, again, are only of an ideal sort, representative ideas are their object, and they are nothing but the desire of one representative idea for another, the desire to rise from a lower degree of distinctness and clearness to a higher. Where then is the thing represented? This ideal world of monads, mirroring their own activity, really lacks the mirror as well as the image.

perceptions, especially perceptions of actions, proves that an external world exists alike for all beings with senses, and essentially independent of the existence and perception of every one of these beings. As my consciousness in perception is dependent on the object, and this is independent of my consciousness, so the perceiving consciousness of every other being is dependent on an independent object. No one could originate common objects for all the rest.

The independent existence of objects once assured, we need no longer believe with the idealist that the sun disappears from existence every day because the motion of the earth withdraws it from sight, or that it only continues to exist because the inhabitants of the opposite hemisphere perceive it.

Our proof that the external world is real rests on two undeniable facts of consciousness; its dependence in sensation and perception, and the existence of social or altruistic elements in it. This proof is carried on without presupposing that any other existence is immediately given than that of one's own consciousness, and this is all that the idealist can fittingly ask. Of these two facts the second is even more important than the first. While the former only enables us to know the existence of something, the latter presupposes the existence of beings like ourselves. Because many men exist whose perceptions agree, whose feelings are complementary, whose actions work together, therefore the external world is real, not ideal, therefore it has existence in itself, not merely in my idea. I call this the *social* proof, that the external world is real, because it is based on the fact that our fellow-men exist. So is proved the fundamental proposition of realism: the independent existence of external things. There is no such contradiction as Hume supposes between our practical faculties, which presuppose this existence, and our theoretical faculties, which, it is said, cannot prove it.

§ 12. There is a realism which precedes criticism of the knowledge gained by sense perception, and a realism which follows this. The former is like the Ptolemaic system, in disregarding the subjective standpoint in our apprehension of the world; the latter, like the system of Copernicus, which looks through the apparent, to the real motions of the heavenly bodies. Idealism might be compared with a system of astronomy, which abolished the existence of sun and planets, and so deprived both Ptolemaic and Copernican system of any real meaning.

Realism, the practical conviction of all men, even the theoretical idealist, is correct in asserting that perception presupposes the existence of the perceived thing, as well as of the perceiving subjects; it is right in thinking that we do not perceive perceptions, but through these perceive things which exist apart from our perceptions. It is rightly convinced that the poles of the globe we inhabit exist, though no man has reached them, that the inside of the earth actually exists, though no one can perceive it, that the fossil bone from an animal of antiquity absolutely proves its self-conscious existence, though no man was there to complement this existence; but the fact that we can transfer ourselves in thought to the past which preceded the human race, does not recall that animal to life and consciousness again.

Realism is in error, however, in assuming farther that the external world exists outside of and before perception in the character in which it is perceived, it is wrong in assuming that things and perceptions must be alike. But this error must not be pressed as too great a reproach, nor can any charge be brought against the understanding. The understanding, originally a practical faculty, has means to rectify an apprehension theoretically false, but practically sufficient. However false may be the natural view of unschooled thought, the artificial view of the ideologist is far more to blame for the doubt and denial that things exist.

Critical realism, on the basis prepared by the Kantian philosophy, undertakes to correct the uncritical. The character of external things is apprehended in the mode of sensation peculiar to sense, its form in the form of sense-intuition and thought; neither is directly apprehended. No exception can be made to this, not even motion. Even this belongs to the world of phenomena, the characteristics of which depend on the attributes of our sense intuition. But in the modification of motion, in the definite relations of objects determined by fixed laws, the forms of empirical intuition—in this regularity of phenomena, or, in other words, in the constancy and uniformity of the conditions under which definite sensations are given, in these we may learn the actual existence of what is real outside us. This regularity of phenomena, which is not dependent on our idea, forms the real content of experience, that which through phenomena we know of things themselves. Besides the transcendental connection of the elements of a given manifold into the idea of a unified object, there are also, according to Kant's teaching, empirical connections of a given manifold which must indeed be arranged into that transcendental connection in order to be thought as objectively valid. These latter, however, are so arranged into this connection that consciousness knows itself dependent on the actual connection of the elements. "Blue is only a mode of sensation; but that we see blue in a definite direction at a given time, must have a reason in reality. At another time we see red there, and this reason in reality must have changed."¹ Experiences in relation to our own existence cannot be separated from objective experiences, nor the quality of a sensation from the qualitative difference of the external influence, nor the constitution of a feeling from the representative idea to which it is related, nor effort and will from the objects

¹ Helmholtz, *Die Thatfachen in der Wahrnehmung*, Berlin, 1879, p. 65. Cf. Riehl, *Philosophischer Kriticismus*, i. p. 431.

towards which they are directed. Our knowledge is knowledge of the phenomena of things ; the origin of our Ideas is not to be sought exclusively within us nor in the things outside us, but both in us and in the things which affect us in consciousness.

The external world (to summarise our result) is real, as certainly as I am not merely an imagining, thinking being, but one that feels and perceives, that wills and acts. I do not exist alone in the world, as certainly as I am connected with beings like myself by social impulses, and feel sympathy and love. The world I perceive is the same world that is perceived by other beings with senses, because the perceptions of every other subject, so far as reality is concerned, coincide with mine, and their actions in general coincide with my actions. And as the world which I perceive exists independently of my perception, so it exists independently of the perception of every other being with senses, because such a being in perception itself (apart from its constitution, which may be different) must be in the same position in which I am, *i.e.*, must recognise its dependence on the object as I do. The existence of the external world is the presupposition of its being perceived.

And at the close of this discussion, I cannot fully do away with the feeling expressed by Hume : " The greatest folly, next to denying an evident truth, is to take much trouble to defend it." I can only comfort myself with the thought that my folly is only the second greatest.

CHAPTER II.

ON THE RELATION OF PSYCHICAL PHENOMENA TO MATERIAL PROCESSES.

§ 1. ADVANCES in the physiology of the nervous system, and especially the application of the universal mechanical standpoint to the explanation of all processes in the living organism, have opened anew the question as to the meaning of psychical functions, and the relation of these to the mechanism of the nerve-processes. In another form this question has been the favourite subject of metaphysical speculation, which has shown its fruitless character here also. So far as it is to be answered by the theory of knowledge, a solution was found by Kant more than a century ago, which remains valid essentially, and with few limitations.

No one can doubt the dependence of psychic states and activities on the processes of the nervous system, which themselves depend on other processes in the organism. Not only does the development and increase of mental life as a whole keep pace with the development and differentiation of the central organs; the psychical as well as the physiological activity of these organs is conditioned by their proper nourishment, by the character of the blood circulating in them, and by the differences of temperature to which they are exposed. To an unprejudiced observer body and mind appear as a single unified being. The same observation also teaches that body depends on mind. Conscious purpose seems no less essential to voluntary motion than is the normal condition of conducting nerve and muscle. Simple observation cannot.

neglect the psychic element in voluntary motion, and this view is confirmed by the fundamental proposition of modern biology, that functions are developed only as the result of their utility.

The more we study this reciprocal relation between the physical and the psychical, the more evident becomes a contradiction which seems insoluble to our thought. As for the simple assertion that sensation and will are material products, which may sometimes act as material causes, it is enough to call attention to the fact that sensation and will are not such products. On this subject we are by no means limited to the purely metaphysical consideration as to what can be and what cannot be. The principle of the conservation of energy warrants the assertion that a mechanical cause has actually none but mechanical effects. The mechanical cause goes over entirely into its mechanical effect, and the interconnection of external processes is complete and without gap, so that no room remains for a result not mechanical. Sensation and will cannot enter this series as effect or as cause. Causal relation between nerve stimulation and sensation, between will and motion, seems to be entirely shut out, and that by facts, not merely by *a priori* arguments. The causal relation between physical and psychical phenomena cannot be denied, because only like results come from like causes. The proposition that cause and effect must be of the same kind limits only our knowledge of the causal relation, not this relation itself. Much may happen, and does happen, in nature which we cannot apprehend analytically from its conditions by the proposition of sufficient reason. Again, the simultaneity of nerve stimulation and sensation need be no reason for denying a causal connection between them. Every cause is strictly simultaneous with its effect, and in saying that causes precede, we do not mean complete causes. The only reason that excludes in this case the assumption of causality, is that which has been given.

Sensation is in fact not the effect of mechanical causes, nor is will the cause of mechanical results;—sensation is no material product, will is no physical force. From the standpoint of natural science the one is without cause, the other is without effect instead of being a *causa sui*.

There is an antinomy, it may be called the physiological antinomy, between the principle of evolutionary biology, that functions develop only as the result of their utility, and the assertion of physiology that psychic functions are mere accompaniments of certain nervous processes, not depending on them, nor producing any effect on them. The mind naturally sides with biology, yet the physiological view is the simple result of the fundamental principles of mechanics, in particular, the principle of the conservation of energy.

§ 2. There can be no contradiction in experience. If conclusions from empirical propositions are contradictory, the contradiction cannot concern the actual content. Both propositions must remain true: consciousness is not merely a product, but a factor in the advancing development of the animal, and consciousness is without mechanical results.

The poorest way of avoiding this dilemma would be to modify slightly the empirical basis of both propositions till the results agreed. The claim may be made that the biological principle, that only such functions are developed as are useful to the subject, is not so universal as to forbid any function not absolutely needed. Useless as some functioning organs appear at first sight, we cannot avoid the assumption that each brings some advantage to its possessor, and this assumption has often been wonderfully confirmed. Certainly functions so widespread and so highly developed as the psychical can be no exception to this rule. Perhaps it is easier to make an exceedingly slight exception to the principle of the conservation of energy. This principle is proved valid, one may say, only to the limits reached by

observation and measurement. It might be conceivable that a very slight quantity of mechanical force, so small as to escape observation, disappears and is transformed into a psychic quantity as often as sensation or effort occurs. One might also think that the will introduces a motion of the body without doing work. The motor mechanism of the body might be considered as an adjustment so perfect that an infinitely small force would set it in motion. An infinitely small quantity always remains a real quantity, however small. Small as one may think the force of the will that starts the organism, it can never be reduced to zero. Unless it is to come from nothing, it must be drawn from the present measured store of mechanical force in nature. It is indeed the function of will not to create motion, but to regulate it; yet this regulation of motion requires the application of energy, not to mention the fact that the countless repetition of countless volitional impulses in animal nature when summed together would make not a small but a very great deviation from the principle of conservation of energy.

Hæckel and Nægeli succeed in avoiding the physiological antinomy no better than those who attempt to modify fixed scientific principles. Because consciousness evidently is not to be deduced from material processes, these investigators make it a universal original attribute of material processes. They equip each atom and each atom-motion with a fragment of mind in the form of sensation and effort, thus really multiplying indefinitely the dualism of body and mind which they aim to set aside, and making consciousness the most superfluous thing in the world. If psychological analysis were not neglected to a marvellous degree in scientific circles, this hypothesis, which has won some popular favour by its clearness, would never have been proposed. Sensation cannot be isolated atom by atom from other conscious stimulations, nor can it be taken from the

connection of consciousness. While several connected atoms result in an external collective unity, every sensation and every connection of sensations is the function of consciousness as a single whole.

Both the biological proposition affirming the meaning of consciousness for the animal world, and the physiological proposition denying this, must be alike true, because both are based on experience. Yet they cannot be true at the same time, for they are contradictory in idea and in expression. How can we understand this contradiction? Certainly not as a duality of the empirical understanding. A fact cannot at the same time occur and not occur. If a fact and its contrary seem to be true simultaneously, it can only mean an apprehension of one and the same thing from opposite standpoints. From the one standpoint a fact disappears, which appears from the other. Since the contradiction cannot be in the content of experience, it must originate in a definite presupposition, which is erroneously regarded as fact. The physiological antinomy only appears on a certain presupposition; on this basis it is unavoidable and insoluble. This presupposition must be false, for it leads to contradictory results in regard to one and the same fact; its opposite must be true, for only thus can experience become self-consistent. This presupposition is that the mechanical processes in nature are absolutely real, in the form in which they appear to sense; its opposite is the critical theory that these processes are phenomena of the real, the constitution of which cannot be known directly, but only by its effects on consciousness. Evolutionary biology and physiology become contradictory only because they both accept the former view. The physiological antinomy is therefore an indirect but absolutely valid proof that critical realism is correct.

§ 3. The dogmatic view of the phenomena of the external world, which Kant attacked in the "Paralogisms," still prevails in natural science. Only thus

could a scientist say, "Mental processes have no analogies among other natural phenomena,"¹ though there can be no question that natural phenomena are known to us only in the form of ideal representations, *i.e.*, mental processes. The scientist may abstract from consciousness in observing natural phenomena, but he cannot exclude consciousness from his observation of phenomena. In following the connection of external processes, as suggested by his objective conceptions of matter and motion, he never finds inner conscious states; and the reason is not that such states and activities are or could be absent in the observation of external processes, but only that he does not think of them, and does not need to think of them so long as his attention is turned exclusively to the physical side of phenomena. The distinction of physical and psychical, of outer and inner, is reached and determined only by abstraction. There are given psycho-physical phenomena, one side of which, the physical, points to an external reality independent of us; while the other is the basis of self-knowledge. Neither inner experience, as many philosophers say, nor outer experience, as students of nature assert, is directly given, but only the consciousness which includes inner and outer experience in constant interdependence.

Physiology as a natural science has neither need nor interest to go back to the origin and basis of our knowledge of the external world. It assumes this knowledge as given, without, however, reflecting on the mental conditions which it presupposes. So it treats external phenomena themselves as things which should possess outside of perception those qualities which they get only in relation to perception. Physiology does indeed recognise the subjective element in sensation. In this sense J. Müller speaks of specific energies. But it makes an exception with reference to the perception of space and motion,

¹ Hermann, *Kurzes Lehrbuch der Physiologie*, Berlin, 1882, p. 6.

refusing to recognise in this any subjective element. We have already called attention to this inconsistency. If the physiologist plays the philosopher with these presuppositions, "he will constantly be misled into a false investigation, how that can exist *per se*, which (like matter) is not a 'thing-in-itself,' but the phenomenon of a thing in general."¹ Consciousness cannot be deduced from the phenomenon or idea of matter, because this phenomenon occurs for consciousness, and so presupposes it. So far the proposition of the physiologist that consciousness is not to be conceived as a product of external processes in the nervous system, is valid, and indeed self-evident. But though consciousness is not to be deduced from material processes, which are phenomena, and cannot act on these in a material or mechanical manner, yet this does not compel us to regard it either as original, or as without effect. Sensation and will are sometimes essential elements of the nervous process, which, like every other process, appears as motion (or may be so represented) in that part which is related to external sense,—this assumption is necessary if dualism is to be avoided. To this extent the biologist's proposition is valid, that thought and will are essentially connected with motion, *i.e.*, with the process which appears to external sense as motion.

§ 4. Carefully as Kant would have tried to avoid certain objections from a succeeding period of dogmatic physical science, he expresses himself distinctly as to the relation of physical and mental phenomena. "All difficulties which concern the connection of conscious nature with matter arise without exception from the surreptitious dualistic idea that matter as such is not phenomenon, to which an unknown object corresponds, but an object itself, existing outside us, and independent of our sense. Matter, the association of which with the mind causes so much misgiving, is nothing but a mere

¹ *Kritik d. rein. Vernunft*, ed. i. p. 381; Ros., p. 304.

form, or a certain mode of representing an unknown object by that intuition which we call external sense. So long as we connect internal and external phenomena with each other as mere representations in our experience, there is nothing irrational, nor anything to make the association of the two strange. But as soon as we hypostatise the external phenomena, looking upon them no longer as representations, but *as real things existing outside us, with the same quality with which they exist inside us*, and referring to ourselves as thinking subjects the activities which they, as phenomena, show in their mutual relation; then we have a kind of active causes outside of us, which will not harmonise with their effects within us, and we entirely lose the thread of the causes in the effects which should come from these for the internal sense. But we should notice to the contrary, that motion is not the effect of this unknown cause, but only the appearance of its influence upon our sense, so that both are not something outside of us, but only representations within us, and consequently it is not motion of matter that produces ideas in us, but this motion itself (and the matter also which is known through it) is representative idea only. And, finally, the whole self-made difficulty comes to this, how and why the representations of our sense stand in such connection that the ones we call external intuitions can be represented as objects outside us according to empirical laws—a question which is wholly free from the imagined difficulty of explaining representations as the product of efficient causes outside us and different from us in their nature, since we avoid the confusion which arises from treating the phenomenal appearance of an unknown cause as the external cause itself.”¹ These statements from the “Paralogisms” cannot have been before Du-Bois Reymond when he proposed the question; How does the motion of atoms produce sensations? and

¹ *Kritik d. rein. Vernunft*, ed. i. pp. 385-387; *Ros.*, pp. 307, 308.

found no solution in experience ; for they are a critique of his statement of the question.

What has been said against hypostatizing external material phenomena must hold also against treating inner phenomena as things. If the conclusion from material phenomena to a material substance behind these phenomena is false, so must be the conclusion from psychic phenomena to a psychic substance. In both cases, to use Kant's words, "the difference in the mode of thinking objects, which remain unknown to us in their true character, is regarded as a difference of these things themselves." According to Kant we have no ground, at least no ground theoretically, for asserting that the substratum of mental phenomena is different from and independent of that of physical phenomena. "If we compare the thinking ego, not with matter, but with the intelligible background of external phenomenon called matter, we cannot assert that the being of the mind is in any way distinct from this, for we know nothing at all of it. Matter means not a kind of substance totally heterogeneous and different from the object of the inner sense (mind), but only the different nature of the phenomenal appearance of objects (themselves entirely unknown to us). The transcendental object (= *Ding an sich*) is alike unknown for inner and outer phenomena."¹ Of an unknown object, "one cannot tell what it can do or cannot do," and therefore cannot assert that this unknown substratum of phenomena is not the cause of ideas in us. We find the same thought again. "The ego, as thought by the inner sense in time, and objects in space outside it, are indeed entirely distinct phenomena, but they are not for this reason to be conceived as different *things*. The transcendental object which underlies external phenomena, as well as that which underlies inner intuition, is itself neither matter nor thinking being (*an*

¹ *Kritik d. rein. Vernunft*, ed. i. pp. 360, 373, 385 ; Ros., pp. 289, 298, 307.

sich), but an unknown cause of phenomena which gives us the empirical conception of both (matter and thinking being)."¹

If we may understand this last as meaning that the attributes from which the empirical conception of matter is formed are just as relative as the attributes from which we get the conception of mind, it really gives us the key to solve the difficulties that remain, after all that is imaginary and frivolous has been separated from that "ill-famed question as to the connection of thought and matter." Accordingly we understand that the real which produces the phenomenon of matter is not merely the object in space, and the persistent quantity as it may be known by external sense; so every occasion for the dualistic hypothesis is removed.

The refutation of dualism is the lasting merit of the "Paralogisms." But I do not assert that all views which Kant defends in this chapter are to be transferred into modern science. Kant's adversary, the dogmatism of rational psychology, has been driven from the field so effectually that it would be superfluous to take up the battle again. Since then the question has not only shifted, it has assumed another form, by reason of the consequences men fancy they must draw from the principle of the conservation of energy. Moreover, Kant's critique of the conception *mind* is affected by the purpose which controls the whole book, and involves the argument in so many contradictions. The theoretical knowledge of what is beyond sense is given up to get a practical knowledge of it (still dogmatic); man's moral consciousness is made a faculty for knowing the supersensual. Thus Kant's assertion that things are unknowable is too absolute, and has no limitation in favour of an empirical knowledge of them. The introduction of moral standpoints into a purely theoretical investigation, as, for instance, the question as to the relation

¹ *Kritik d. rein. Vernunft*, ed. I. p. 379; Ros., p. 303.

of physical processes and mental phenomena, involves Kant's view in uncertainty and even in contradictions. He indeed attacks the "transcendental" dualism, which transforms an antithesis of phenomena into an antithesis of things, but he leaves open an escape to "transcendent" dualism. Though there be no theoretical "purely speculative" reasons to prove that mind is independent of body, yet it may be, he says, "that I can find reasons elsewhere to hope for an independent existence of my thinking nature, persistent through every change of state,"—in other words, that "those very things now wholly unknown may be represented in other form than that of matter" by the thinking subject after death (and indeed before birth). A critique of this opinion would require a repetition of what has been said against the transformation of things themselves into noumena,¹ and against the related conception of an intuitive mind, perceiving without senses. It is only necessary to remark that the confusion of practical and theoretical standpoints is as injurious for morals as it is for science. Man's moral consciousness undoubtedly has other and far surer basis than a possibility, which must be conceived in terms absolutely impossible, or at least unverifiable. Who would wish to found morals on the quicksands of metaphysical speculation? Must morals be given up if there is no individual life beyond the grave? Socrates and Spinoza thought better of man's moral consciousness than did Kant.

Setting aside practical motives, for this is necessary in scientific speculation, we have before us Kant's own view, as demanded by the *Kritik*, in the statement: The basis of material and of mental phenomena is neither matter nor thinking being. This critical statement applies as much to spiritualism as to materialism. It asserts the existence of a single basis of both material and mental phenomena, and it limits the knowledge of this to these

¹ Vide Riehl, *Geschichte und Methode der Philos. Kritikismus*, p. 435.

phenomena and their empirical relation. This transfers the question before us out of the realm of speculation into the sphere of experience and criticism of conceptions.

§ 5. To enter upon a refutation of dualism to-day is to go back of the position reached by Kant. Dualism is only consistent on the presupposition of materialism, by which we mean here simply the theory that identifies the external phenomena with the external cause of these phenomena,—and then it is unavoidable. The coexistence of consciousness with a world which itself consists of matter and mechanical force, can only be explained by the assumption that a particular substratum, different from matter, and indeed antithetic to it in its non-spatial character, underlies psychic phenomena (the existence of which is least of all to be questioned),—or rather this coexistence immediately proves the assumption. Materialism and monism are totally incompatible. Dühring, and those who like him find in matter “absolute being, and in this all else,” are thinking not of matter, but of a *Ding an sich* different from matter, and involving also certain qualities which only result from the effect of a thing on external sense.

It is impossible to define matter without introducing into the definition, expressly or furtively, the relation to consciousness which perceives things as material. The general attributes which we ascribe to objects of external perception, are at the same time attributes of the process of perception. A penetrating thought of Kant, in a posthumous work, suggests that the reactions of consciousness involved in the acts of perceiving external things correspond to the affection of consciousness by external things independent of our being. The very fact that one and the same thing, apprehended by different senses, appears different, and cannot be represented except in relation to some sense, proves that the constitution of the thing itself is not directly known. In connection with every mechanical process in the external

world, the reality of which cannot be doubted, we have to think an observer to whose senses this process appears as mechanical.

Nor can mind be defined except in relation to matter. Every description of the psychical processes within us expresses at the same time something about the material events accompanying these processes. In speaking of the reproduction of ideas, of the effect of external association by coexistence and succession of impressions, of the influence of habit and repetition in fixing trains of thought, we describe physiological as well as psychical facts. The exception to this relativity of self-knowledge, which Schopenhauer made in favour of the will, is not really valid. We know no will "in itself," but only single acts of the will, variously determined; it disappears as phenomenon as soon as its end is attained, and so cannot be separated as phenomenon from the external causes occasioning it. Apart from its motives and its objects, what is will but an unknown basis of effort which sometimes assumes the meaning of will? Schopenhauer omits from his conception of will the one condition that is never absent from an act of the will, namely, the idea of an object. His "Will," like Hegel's "Idea," thus becomes an unknown thing, and the word has no meaning. Moreover, Schopenhauer's admission that we only know our own will empirically, is enough to destroy any foundation for his theory that will is the inner being of things. The will as a phenomenon is not given more immediately than matter. The fact remains that the knowledge of ourselves and of things outside us, although real in that it lays hold of objects as actual, is nevertheless relative. It is knowledge of the relation of things to consciousness, of consciousness to things.

Material things and processes are not different in kind from psychic phenomena. They both are phenomena in consciousness, and, moreover, phenomena which determine each other reciprocally. The distinction,

or antithesis, if this word is better, consists only in the fact that the former class may be objectified, the latter not. Only the former points to an external reality independent of us, and immediately known in sensation. Dualistic speculation as to the way in which a non-spatial being, the soul, may find points of contact by which to affect being in space; or how, without being itself movable, it may be affected by the motion of material elements, has lost all interest in a critical age. He who confuses a logico-grammatical subject with a thing itself existing, must learn from the *Kritik* that the simplicity of an idea by no means proves that its object is simple. The unity of consciousness is a process which produces all connection of experience for representative thought; and yet it is itself not an unrelated monad, but dependent on the continuity of the individual life. The manifold of conscious stimulations with which it is connected is its correlate; without this it may indeed be named, but cannot be represented or realised. Actually and in its essence, the unity of consciousness constantly varies with the manifold comprehended in it. As Dühring has well said, we have no right to conceive it as different from, or independent of, the basis on which the synthesis of this manifold is possible. The common idea of the ego, to quote Dühring again, has reference not to the unity of consciousness, but to the individuality itself; this individuality is entirely independent of consciousness, and so has no bearing on the conception of the ego.¹

§ 6. Dualism as a system must be set aside; as a method it may be kept. Physiological investigation and psychological analysis show an antithesis of direction in knowledge, even if there be no antithesis in the objects to be known. The more completely the mechanism of external processes is understood, the more nearly is realised the ideal task of explaining all phenomena in the external

¹ Dühring, *Natürliche Dialektik*, pp. 183 *seq.*

world mechanically; so much the more will it be felt necessary to investigate the qualitative side of natural events in the single case accessible to us. The qualitative investigation of nature, which coincides with psychology in the largest meaning of the conception, has this advantage over the study of external nature, that its objects are far more immediate. Quantity and the quantitative side of events are abstractions from quality and qualitative events; the latter are never the results of objective quantities and relations of quantities. The knowledge reached by psychological analysis is by no means inferior in certainty to that gained by the objective method, but the certainty is of a different kind, as compared with the exactness of this latter.

The assertion of a qualitative reality in nature, of which we have only signs in the quantitative changes, is no hypothesis. The mere existence of sensation is sufficient proof that such reality exists. Unless sensation be regarded as a supernatural process, it is a natural process. Therefore we must ascribe to causes in nature qualitative as well as quantitative effects. That sensation is no material product we know already, and the reasons for this need not be repeated. It must proceed from the real that produces the phenomenon of matter, its cause must be sought in some reality that is more than mechanical, for this latter feature belongs solely to the phenomenal appearance of nature processes. We do not in our thought add a subjective element to every process in non-animal nature, because we assign to every process a definite character, which may be recognised in connection with the subjective element in sensation. Our assumption is as far from the fetish-belief of "Panpsychism," as from that dogmatic materialism which makes the phenomenon a "*Ding an sich*."

It must be granted that the way in which one body affects a second is not completely understood, that the communication of motion is something into which our

mind cannot penetrate. We only know the regular conditions on which this external result takes place. We cannot even assert with confidence that motion always is communicated, which means simply that all causes in nature (*i.e.*, external causes) consist merely of motions. We are compelled at least to make important modifications in that assertion, to cover the transformation of potential into actual energy, which constantly occurs when the physical or chemical equilibrium of a system is destroyed. In fact, every communication of motion, not even excepting the case of elastic blow, is fundamentally a distribution of mechanical force, of which the cause remains hidden. Causes, even if not "first causes" as the metaphysicians wish, we know only from psychical life. So we are led to assume that a reality of things not mechanical (*i.e.*, not correlative to external sense) must correspond to the mechanism of external phenomena. With this qualitative reality we connect the psychic affections and activities, sensation and will.

§ 7. The mind requires us to explain all processes in nature from mechanical causes, that we may know them; and this requirement is in no contradiction with the requirement to explain certain processes in nature from psychic causes at the same time. The former requirement is concerned only with the quantitative side of a process, the latter applies to the same process on its qualitative side. The two explanations are only contradictory, if they not simply apply to the same phenomenon, but also apply to this from the same point of view. A motion as such cannot be explained from the will; whether it occurs with or without will, it can only be explained on mechanical grounds. Yet the will may have an essential connection with a definite process of motion. In other words, a process which takes place with our will, and which, like every other event in nature, is represented to external sense as motion, could not occur without our will; without will it would not be the

same process, even though nothing in the external phenomenon distinguishes it from other cases of motion.

But does not this assertion seem to contradict the continuity of the mechanical course of events which, from our standpoint also, includes the phenomenon of will-activity? I answer that there would only be such contradiction if we must regard the will as *uncaused*. But grant that the will is a necessary result of the qualitative efficiency of those very processes which we perceive externally as mechanical, the occasion for a contradiction with the mechanical view of nature disappears. The principle that mechanical energy is constant determines nothing as to the condition and distribution of energy; granted that we must conceive these conditions as mechanical, for I do not deny this, yet we must not forget that the mechanical side of a cause teaches us nothing about its true character. In any given case this may be an impulse of will. Mechanical nature is not nature itself (*an sich*), but the phenomenal appearance of this to sense.

Our conception differs from the mechanical view only at one point, namely, when we find it necessary to assume, not indeed absolute spontaneity, but real activity in nature. The mechanism of external phenomena, or, as one may say, of things, in the outward appearance, is not regarded as self-existent, but it rests primarily on the sense-representation of things. There could be nothing even relatively independent in nature unless true activity existed in it, not merely a transferred, illusory activity. For the physical as for the moral, independence is rooted in self-activity. Though we do not have to think the elements as psychically active, *i.e.*, as monads, yet the phenomenon of psychical activity points to an action that is real, proceeding from the elements, and not merely impressed on them. Only what can act, exists or can be called *actual*. In sensation, which is not mere receptivity, but reaction against

external stimulus, we have the type of all reciprocal action even in non-percipient nature. The impulse of self-preservation, the unifying function of thought, by which we unite the manifold felt stimuli into a single idea, and the consciousness that we ourselves act, as often as we act with will,—these are phenomena incompatible with the assumption that a purely mechanical efficiency is transferred to us from things. Inner experience is complementary to the mechanism of external phenomena; it shows us processes which are not merely produced but productive.

§ 8. If the will initiates motion, and still this motion is to be completely deduced from its mechanical causes, it follows (1) that the will is not a mechanical cause of this or any motion, and so that it is not needed to explain such; (2) that the will must be identical with the immediate mechanical cause of motion, viz., cerebral innervation, in fact if not in phenomenal appearance. The first conclusion results directly from the necessity of tracing back every case of motion to homogeneous, *i.e.*, mechanical causes, a necessity which is correlative to the principle of the conservation of energy. The second can only be avoided by assuming dualism, and this, in fact, increases the difficulties it aims to solve, and unnecessarily makes two secrets instead of one. We cannot say that the will merely corresponds to the central innervation or runs parallel to it; we must rather say it is one and the same process which, objectively considered, is central innervation, subjectively considered, an impulse of will. As elsewhere different and even disparate conceptions may become identical for our thought, in that they determine only one single object, so psychical phenomena and the corresponding physical processes may be regarded as identical, in so far as they are different modes in which one and the same thing appears.

However, we have no reason for extending this view

beyond the sphere of physiology, nor beyond those processes of the mind which experience shows to coincide immediately with conscious stimulations and activities. The view here proposed is not the hypothesis so popular to-day, that physical and psychical correspond—an hypothesis involving some hidden dualism. It differs from this in that it asserts the definite identity of that process which underlies at the same time physical and psychical phenomena. (That which must appear as cerebral change from the standpoint of another observer, if it could affect his sense, is in itself the same thing that for one's own consciousness appears as impulse of will.) Secondly, it develops no theory of the universe from this identity; it is limited to the points at which the subjective and objective world actually touch. It still asserts that a definite mode of extension corresponds to every modification of phenomenal thought as it appears, but it does not regard the converse of this as valid. Not all processes in nature, only certain processes in animal nature have this twofold phenomenal appearance, according as they are considered from the standpoint of an external observer, or from that of the animal itself. The difference between conscious and non-conscious stimulations remains for this view as real as before.

§ 9. The psychical results do not follow physiological processes in the nervous system immediately and step by step, but only at a certain distance. Countless nervous processes, peripheral, central, and connective, must unite to produce one psychic element, sensation. Our proposition that the psychical of inner experience is to be thought as identical with the physical of outer experience, applies only to the last terms of these processes—the terminal processes, as v. Kries calls them. These alone are to be regarded as the correlate of subjective stimulations, sensation and effort, in the world of external sense. For this reason, also, it is impossible to speak

of a thorough correspondence, a parallelism of physical and psychical. A composite physiological element corresponds to the simple psychical element. Indeed nothing psychical is simple, except the mere abstract form of the ego-idea; we can only say that the psychical has an elementary phase, sensation, and we know that this is composite because its objective correlate, the physiological process, is composite. And sensation includes all of consciousness in germ. It is the feeling that one is affected by a stimulus, reaction against the stimulus, and an idea of its character; so it unites in itself the beginnings of the intellectual process, representative thought, the emotional process, feeling, and the emotional-intellectual, willing. The very time-rhythm of psychical processes does not immediately follow the nervous processes, even when these are rhythmic, as in the case of reflexes. Reaction-time, including sensation, is longer than reflex-time, and becomes longer yet when it includes apprehension-time, *i.e.*, the time needed to distinguish the relative character and place of a stimulus before reaction. The course of psychic phenomena is discontinuous, in contrast with the continuous course of life processes in nerve and brain. Change of stimulation is necessary for a sensation. States of consciousness come with a certain regularity out of states of unconsciousness in deep sleep, and the degree of consciousness is subject to constant change of increase and decrease. The fact that the thought of one and the same ego unites these manifold states into a single composite consciousness, does not at all affect the fact that the psychic processes are really discontinuous. This, however, proves that psychic phenomena must be dependent—that they are the effects of those real causes which we represent externally as mechanical in the broader sense of the word, *i.e.*, as processes of motion in nerve and brain. Our empirical ego is the summary expression for the unity of our individual life; it is the same unity which

appears to external sense as an organism with interacting parts and functions, but it is this unity grasped from within.

The error of materialism is only that it seeks to deduce consciousness from the external phenomenon of the real, instead of from the real which underlies this phenomenon. While I think, feel, and will, a series of motions takes place in the central organs. These motions, as I represent them in terms of perception, cannot be the cause of any consciousness, because they are an object. And they only appear phenomenally as motions, *i.e.*, as successive spatial sensations and intuitions, when a second observer stands over against them with his sense and his consciousness. They are not themselves motions, but processes of unknown form, the effects of which alone we know.

Therefore while the connection of psychic phenomena with each other is incomplete and broken, scientific investigation finds the connection of external processes constant and unbroken. In both cases the formal idea of connection is only made possible by connection with one and the same ego-idea—unity of consciousness is the formal ground of synthesis—yet the connection of the material elements of experience is mediated by the objective conceptions, persistence of matter, and indestructibility of energy. Only one of Spinoza's two attributes of substance, extension or material nature, is a complete expression of reality.

§ 10. But if psychical affections are effects of real processes, which underlie the phenomenon of definite physiological processes, in what sense can they still be regarded as causes? Every effect of a previous cause becomes cause of a succeeding effect. Granted that central innervation occasions a motion, *e.g.*, of the arm, it is also granted that the impulse of will which is identical with the innervation, is a causal movement in producing the motion. The physiological, pheno-

menal side of a will-impulse cannot be separated from the psychical. I can consider the former as sufficient reason, from which the motion can be understood as a process homogeneous with the cause; the latter as well as the former belongs to the complete cause. Both, we are convinced, are only different ideas of a single real process. What holds true of one must hold true of the other. It is as true that the will moves the arm, as that the central innervation occasions the motion. It is as true that the hand of the artist is directed by the Idea of his work, as that it is regulated by the cerebral process, which would form the phenomena of this Idea for an external observer. The way which we choose to express one and the same thing depends on the aim and the direction of our thought. If it be a question as to the mechanical influences of the will (in the sense given), we prefer the physiological expression. If it be as to the productive and æsthetic effect of a work of art, we choose the psychological. We can abstract from will and Idea, in explaining the external influences of brain processes, just because will and Idea are psychically the same thing which is represented physically as cerebral process. We deduce external phenomena from external causes. But in certain cases external phenomena are connected with internal; external causes are known as at the same time psychical. We think that everything which happens with consciousness in organic and animal nature (including man's) might happen equally well without consciousness, so far as the side turned towards external sense is concerned. This thought is true if it only seeks to give expression to the method of external scientific investigation. It becomes false as soon as we make out of the method a system under the name of materialism, and regard external phenomena as things and processes themselves existing. On this false assumption the psychical affections and activities are

regarded as wholly without result, though they are identical in essence with certain external processes.

If the will can affect the idea of motion, and this cannot be denied, it thereby affects motion itself. The idea is at the same time a real process, and a change of the idea is a modification of this process. Changes of consciousness are in essence identical with changes of cerebral processes. The influence of the will cannot indeed be mechanical. Only the phenomenon of the will, only the external perception of its influence can be called mechanical. The will affects the "intelligible" side of reality, the *Ding an sich*, and thereby changes the phenomenal appearance of this for sense. This phenomenon, as represented in terms of external sense, is a motion in matter; change in the phenomenon is modification of a material motion. So also the process which appears within the mind as will is, objectively considered, a motion in a material organ. This gives rise to the illusion that the will has no influence at all on voluntary motion; that this motion might occur without idea and purpose in the same manner that it occurs with idea and purpose, though this flatly contradicts the immediate testimony of our consciousness. This contradiction is solved by the critical view of the phenomena of the external world, and only by this. The will does not enter into the connection of external processes, as effect of the preceding and cause of the following, because it is the inner phenomenon of one part of these processes. As has been said, it is as correct to regard a part of objective changes as dependent on will, as to regard this same part as dependent on external causes.

§ 11. Consciousness is inserted between the effect of an external stimulus, and the motion which follows this (briefly between stimulus and result), not as an immaterial being, nor as a mere machine, but as a psycho-physical process, the psychical side of which is given only for the conscious being itself, the physical

side for another observer whose sense it affects, or is represented as affecting. Only one side of the psycho-physical process is actually experienced (the physical, from the standpoint of objective experience, the psychical, from that of subjective experience), while the opposite side simultaneously becomes a mere idea; a proof that the real process itself must be different from both modes of phenomenon.

The position between stimulus and result teaches something of the functional meaning of consciousness. Biology claims that from its standpoint movements can be explained, such as could not be caused by mechanisms innate or already formed. The condition for this is that stimulation and result be separated in time, that a sensation of the stimulus be inserted between this and the resulting movement. The more distinctly the two are separated, the greater the opportunity for the intervening psycho-physical process, so much the greater is the organism's power of adaptation. The chain between stimulus and movement is lengthened by the intervention of the central organs, which are inter-related, one part subordinate to another. The psychic functions of these organs correspond to their development; and more manifold and various connections are constantly arising in them. These functions form a combined inter-related activity, the result of which is shown in the co-ordination and subordination of movements. From the combination of sensations, from perception, results the representative idea; from the combination of ideas comes the conception. The final result, action determined by will, is removed farther and farther from a movement immediately occasioned by stimulus. It is farthest from it in man, for whom a secondary ego, the product of social life, is added to the primary ego. Yet the original simple schema of the influence of consciousness may be recognised even at this highest point of its development. Sensation

intervenes between stimulus and motion, motion is adapted to the sensation of the stimulus. This may be illustrated by the case of instinctive motion or action from impulse. Close to each other as may be instinct and reflex, they are distinguished by the fact that a psycho-physical process, sensation or perception, is necessary to produce an instinctive motion, but the reflex occurs without intervention of consciousness. From this standpoint it is indifferent whether the cause of an instinctive action be sought on the physical or the psychical side of the sensation that occasions motion. A psycho-physical process is invariably distinct from one that is merely physical, but a psychical element is to be separated from the physical only in the phenomenon, not in the thing itself. The execution as well as the occasion of an instinctive action is subject to the influence of sensation. In the case of our own instinctive or habitual action, *e.g.*, walking, we can see that sensation determines with extraordinary accuracy the degree of innervation, and adapts every single motion to the external stimuli until the whole action bears the stamp of purpose. The part of consciousness in expressions of instinct shows that these may change through experience, and are no more infallible than consciousness itself. Romanes in his works¹ gives countless examples both of change of instinctive habits and of perverse actions from impulse. Darwin also, in a posthumous essay on instinct, published in the second of Romanes' books, gives some cases of incomplete or erroneous instincts. The pathological phenomenon of compulsory movements, so called, may be reckoned in the class of perverse impulsive actions or instincts. The cause of these, according to Meynert, is a disturbance of the sensations of innervation, which disturbance produces illusory ideas.² So they are to be regarded just like

¹ Animal Intelligence, and, Mental Development in the Animal Kingdom.

² Meynert, *Psychiatric*, Wien, 1884, pp. 152, 195.

actions from illusory representations. This is the only correct explanation of such compulsory movements, which are no more or less compulsory than any purposeful instinctive movement; and it shows very clearly the influence of consciousness on the form of movement.

As consciousness was developed to meet the needs of the living being, its natural vocation continues to be the service of these needs, namely, the universal organic functions. The relatively simple conditions of existence on which plant life is dependent did not develop the universal sensibility or sensitiveness of organic matter (protoplasm) to conscious sensibility. With the development and differentiation of animal life, on the contrary, especially with the capacity of locomotion, it becomes necessary to separate stimulus and movement by sensation, to adapt movement to the sensation and perception of the stimulus. The more manifold the animal's needs in the battle for existence, the more difficult and numerous the ways of satisfying them, so much the greater share does consciousness have in regulating and controlling movement,—in other words, so much the longer and more composite does the psycho-physical process become. To the primary reflex movement, directly occasioned by stimulus, there is added the secondary movement under control of sensation which we call instinct, and which still imitates the reflex movement until a third form of movement, under the direction of will, is introduced with the development of the higher cortical centres. This does not imitate the reflex, and seems even to be free in the case of men.¹

On the side of philosophy, no one has understood these relations better and presented them more vividly than Schopenhauer. Setting aside his metaphysics of the will, we find his treatment of this topic to be in full

¹ Meynert, p. 152.

harmony with the present biological view of the meaning of consciousness.¹ Schopenhauer, too, regarded the intellect as but a means or tool for the preservation of life as the conditions for this become complicated. The necessity of satisfying the needs of life, under circumstances ever more complicated and more difficult, leads to a separation of stimulus and movement, to an increase of the inner sensitiveness of organic matter up to sensation and conscious effort. In brief, according to his view, as well as the view of present science, the intellect is something produced and secondary, a product of organisation, not the producer of this. It presupposes existence and life; it would reverse the truth, to make existence and life presuppose it.

In yet another point Schopenhauer's ideas may be so treated and extended, as to bring them into agreement with our mechanical view of nature. The fundamental division of causes into mechanical, chemical, physical, and organic, to which Schopenhauer adds motivation of the will, is indeed easily recognised as false. All causes, including the phenomenon of will motion, or what is the same thing, the cerebral process identical with a voluntary motion, are in external form causes acting mechanically, and in this respect there is no antithesis between the effect of a blow and of a stimulus. This mechanism is, however, only that side of material processes which the mind represents as objective. So Schopenhauer is right in positing for each of these processes another moment which does not belong to external sense, and in so far is not mechanical. The mechanical explanation meets everywhere something inexplicable, something itself real, which cannot be expressed in terms of sense. Schopenhauer connects the conscious stimulations and activities of our psychic selves with this non-mechanical reality,

¹ *Die Welt als Wille und Vorstellung*, vol. ii. chaps. 2 and 22. *Ueber den Willen in der Natur.*, Frankfort, 1854, p. 70.

which underlies the mechanism of things and effects the phenomenal appearance of this. Even in insensate nature, he finds a substitute for sensation and knowledge in the fact that a body can be modified in its state of rest or motion by the motion of a second body. This is even more evident in the reaction of organic matter against the stimuli, the effect of which is no longer directly mechanical, but only indirectly (in that they occasion motion). His only error is that he transferred the highest phenomenon of mind, namely will, to this "subjective being" of external things and processes, without being conscious of the purely metaphorical character of the attempt.

§ 12. Unless consciousness is to be made a transcendent being having no analogy with other phenomena, unless it is to be separated from the natural processes with which it is connected, and on which it is dependent in every stimulation and activity, then it only remains to exchange the one-sided mechanical view of external things for the critical view, which can explain consciousness consistently with the mechanical view of nature, without questioning a single fact in this. Either dualism with all attendant contradictions, or critical monism, there is no third view; as we have seen, materialism demands dualism.

Critical monism is not to be confused with the metaphysical theory that some unity includes everything, nor with any form of panpsychism. It is limited exclusively to the relation of certain physiological functions (among higher beings, the functions of the cerebral nervous system) to the simultaneous psychical expressions of sensation and will. It does not regard nourishment and generation as psychical actions in their inner qualitative reality, nor does it dream of a love and hatred of atoms when connections are formed or dissolved. It cannot lay as much weight as does metaphysics on the question of substance. This con-

ception it uses even less than the conception of matter, as a form by which the real itself may be known. The conception of matter has as its content at least the persistence of a quantity perceivable in space, *i.e.*, it expresses an actual relation of things to our senses: while the conception of substance (logically the positing of a subject) expresses only a thought-relation of things to our understanding. The very conception of qualitative reality excludes continuous transition from one attribute to another, while such transition cannot but occur in the case of pure quantities, the conception of which is formed by abstracting from specific differences. Qualities, as sensations of the different senses show, are not comparable with each other, they are disparate;—and instead of assuming with physiology that sensitiveness to specific stimulation is a peculiarity of the sense organs, we regard it as a universal attribute of things. From the combination of qualitative effects, arise new qualities, not yet present in the quality of every single effect taken by itself. Even if a qualitative reality must underlie the external phenomenon in order to produce the mechanism of that lifeless nature from which consciousness and sensation come—and the existence of sensation and consciousness proves this—still this reality need have no similarity to the mode of sensation and feeling which exists among living and sensitive beings. Cause and effect are identical only from the mechanical standpoint, and there because we have made them identical by abstraction from the specific and qualitative. What appears to us as mechanical process in and through material elements, even apart from the phenomenal appearance of this to external sense, has its own being and activity; yet this does not mean that this being and activity must at the same time perceive itself, or appear in the consciousness of the elements.

Consciousness is no result of mechanical effects, these

mechanical effects are results of the way in which external sense apprehends changes in nature, or causes them to appear phenomenally.

§ 13. The difficulties inherent in this view are not greater but less than the difficulties which stand in the way of any other theory of the relation of material and mental phenomena. They may be all reduced to the question, How is a double phenomenon of one and the same thing possible? This question has already been answered above. The two phenomena, in which one and the same process is represented to external and to internal intuition, never occur simultaneously for one and the same subject. I do not perceive the states and activities of my own consciousness as cerebral processes; it is only the activities of another's consciousness, or of my own when regarded from the standpoint of another observer that I think in this form. If we speak of correspondence, a parallelism of psychic events with physical, we cannot overlook the fact that of these parallel phenomena, as often as the one belongs to real experience, the other always belongs to possible experience. If the one side of the occurrence comes into the phenomenon, the other retreats into the idea, and *vice versa*. As often as the one becomes mere idea, the other becomes actual phenomenon. The proposition that psychical and physiological correspond, is valid in the physiology of consciousness only with this limitation.

Finally, the thought that that which produces or may produce results possesses also an existence for itself, is unavoidable. As there can be no subject without an object in mental representation, no more can there be any reality outside the mind, which exists only for another and not at the same time for itself. We regard the action of material elements in nature as reciprocal, every element reacts with force equal to that which acts on it. If in any system of elements connected in a single organism, either the total effect from without, or a part of this,

be felt as a change of state, and the reaction as effort, then we have before us in this reciprocal relation of sensation and effort only a farther (qualitative) development of the universal relation of reciprocity, of action and reaction.

§ 14. The physiological and psychological investigation of mental processes are complementary. Their methods are different, the points of view antithetic; but their results serve each to explain the other. Psychology is a science subordinate to the physiology of the central nervous system, but it reaches farther than this in that it embraces the mental life of men, which results from the reciprocal action of psychic unities. Social psychology is only indirectly connected with the general physiology of the nervous system. Its peculiar, as it were indigenous, principles are by nature psychological. Just for this reason history cannot be treated as natural science in the more exact sense of the word, and Buckle overlooks the true meaning of external investigation when he classes history with this.

The services which psychology accomplishes for physiological investigation on the field common to both sciences, are to-day even greater than those it receives in return. A glance at Meynert's physiological representation of reasoning processes shows that the direct psychological knowledge of these processes has given the outlines for that representation. It first teaches the physiologists the meaning of certain connecting apparatus in the brain, and his description of the cerebral processes of reasoning only translates the statement of subjective experience into terms of objective. The fact that this translation succeeds, that physical correlates for psychical activities are to be found in external intuition, confirms the truth of critical monism.

We can often prove that physical and psychical occurrences are parallel in nervous substance, and all our psycho-physics is based on the assumption that this

is always the case. Rightly understood, this means that in reality we are dealing not with two processes, but with one. The form of this process as it appears in consciousness is known far more immediately than its physical counterpart. In regard to the general character of the former, at least, there can be no doubt. We perceive the affections of our sense, we feel the impulses of our actions, we distinguish intellectual acts of judgment and conclusion from those that are also emotional, and from an activity of the will with its source in feeling. On the other hand, with reference to processes objectively perceived, which accompany these psychical states and activities, there is no agreement as yet among physiologists, apart from the universal view that they are mechanical in the larger sense of the word. Yet Hering's hypothesis, which regards these processes as chemical, seems to deserve the greatest respect, because it starts with the most universal and best known quality of living matter, namely, interchange of elements. Though Hering only uses this hypothesis directly as the foundation for a new theory of vision (which offers a remarkable physiological confirmation of the qualitative distribution of the retinal activities, that Schopenhauer asserted), yet he himself gives it a more universal meaning. Nerve physiology, Hering remarks, has sufficiently proved that every motion or activity of nervous substance alters it chemically, and all our ideas of changing, stimulation, fatigue, and restoration after activity, are based on the assumption of chemical changes, so that the physiologist has perfect right to conceive the life of nerve substance, and likewise that of psycho-physical substance, as in the first instance chemical.¹ That which comes into consciousness as sensation would then be considered as the psychical expression, or the conscious correlate of

¹ Hering, *Zur Lehre vom Lichtsinn*. V. Mitth. 1874 (Aus dem 69 Bde. der Sitzungsberichte der k. Akademie der Wissenschaften 3. Abtheilung).

the interchange of elements in the nervous system. This hypothesis is in full harmony with the universal views of organic life at which Claude Bernard arrived, and is confirmed by these. The French physiologist treats the life of the organism as the result of two processes inseparably connected, and reciprocally needing each other. These he calls organic destruction and organic synthesis. With each expression of activity by the organism is connected a waste, a process of dissimilation or division, which is followed by the complementary process of compensation, of organic assimilation.¹ In this double process of each single organism, of each cell, the nervous system shares both as a whole and in its elements. If we add the conjecture that the characteristics of the elements are an immediate factor in these chemical processes, that these processes depend on the nature of the elements, here also we must choose the chemical rather than any physical hypothesis. "Why Du-Bois Reymond," says Hering, "should propound a purely physical hypothesis as to the processes in the nerve fibre, is conceivable because he really only attempts to explain the phenomenon of nerve processes as indicated by his multiplier. If he had had as fine a chemical reagent for nerve changes, as he had electrical, in his multiplier, he would have offered a chemical hypothesis. The hypothesis he does give does not stand in the way of the assertion that so far as our knowledge goes, the activity of psycho-physical substance cannot well be thought without simultaneous chemical changes."

But however objective science may denote the physical phenomena which accompany psychical, whether as chemical or physical, our general view of the identity of the process underlying this two-sided phenomenon will not be altered by the more exact idea of the form in which it is presented to external sense.

¹ Claude Bernard, *Leçons sur les Phénomènes de la Vie*, &c., Paris, 1879, p. 22.

Psychic states and activities are not dependent on the external phenomenon of things, the phenomenal appearance of these in consciousness is rather the result of a psychic activity. The will does not contradict the mechanics of external processes. The obedience to law, which from an external standpoint we treat as mechanical, unites the will with its result on the one hand, and its causes on the other; and the active mechanical force of innervation, which we experience as impulse of the will, is different from this impulse only in phenomenon, not in essence; an innervation without impulse of the will is no longer the same real process as an innervation with this impulse. Consciousness and will originate in the qualitative reality of things, of which the abstract quantitative expression is given in the mechanical relation. The mechanics of external nature is nothing that could be presupposed of things themselves, not a law to be laid on them from without; it is the expression of the proper activity of things, the result of their unchangeable qualities. In the modern mathematico-scientific period mechanics has assumed the rôle of fate in ancient thought; a phenomenon of things is made a power over things themselves. But this mythology of physical science, like every other, must finally yield to the critique of conceptions. The question can no longer arise—How are sensations to be deduced from conceptions which we deduce from phenomena, *i.e.*, in the last instance from sensation?

§ 15. The parallelism between psychical and physical events only occurs, as we have shown, between the inner phenomenon of one's own, and the outer phenomenon of another's, consciousness. To assume the opposite, *i.e.*, to presuppose that this parallelism is given in one and the same subject, is to fall into the oft-denounced error of regarding physical phenomena themselves as independent of external intuition. Every stimulation of our psychic self does not simply presuppose an external cause; it

itself forms an element of objective experience for a second consciousness. But the converse of this proposition as to the correspondence of psychical and physical is not valid. Not every physical process which as such is an element of objective experience, needs to be connected with a self-consciousness which experiences within itself this process that for us is external. We have no reason for extending psychical life beyond the limits of organic animal nature. This brings us to the question as to the objective criterion, by which we can determine the presence of psychical activities.

If we find a developed central nervous system in an animal, we conclude with certainty that the physiological organisation of this system is accompanied by psychical phenomena. But this does not give us the more exact character of these phenomena, nor does it answer the question: What definite actions of the animal must we regard as accompanied by consciousness? We know that not every function of the nervous system is connected with mental processes. But few physiologists are inclined to follow Pflüger and Schiff in assuming psychical functions of the spinal cord; there is no reason to think that a sensation is perceived except in the cortical centres. Unconscious sensations and unconscious psychic activities can only be discussed by those who confuse objective and subjective experience. If we knew perfectly the mechanism of motions in the nervous substance, and in addition the changes, lasting or brief, which this substance has previously experienced, and which determine the character of its reaction to renewed external impressions, still we should have no objective criterion for determining the presence of consciousness in this substance. All motions, even such as are voluntary, may be understood mechanically. Mechanical explanation is as far-reaching as objective experience, as we know since the principle of the persistence,

conservation, and transformation of energy was established. But because we do not know the nervous mechanism perfectly, and can hardly expect to, we may regard the following as an objective criterion of consciousness, viz., the power to choose between two or more actions which are alike possible, so far as known mechanics are concerned, in order to select the one best adapted to a purpose. This choice makes the reaction-time longer than that of reflex action, so that we may have an objective criterion (longer reaction-time) for the presence of consciousness. We know that reaction-time is increased because the higher central organs (the cortex) have a share in producing the motion, and we know that consciousness is connected with the functions of these organs.

Any conclusion as to consciousness in the case of lower animals without a nervous system will be the less secure, the simpler the animal organisation. Adapted motions apparently resting on choice are not enough to establish it, for we find such motions in plants, and not even a poet thinks of ascribing sensation to these. Still I think that we can safely assume elementary acts of consciousness in free moving organisms with organisation relatively as simple as that of plants.

§ 16. We find an anomaly to this law of the correspondence of inner and outer as already defined, in the fact that psychical phenomena are arranged not only by coexistence and sequence, but by inner relation or similarity. So far as external association is concerned, we find no difficulty in pointing out the corresponding objective facts in the general characteristics of the nervous mechanism, for this mechanism is constantly adapting motions to each other, and producing habit as the result of repetition. But for association by inner relationship, we can think of no mechanical counterpart. It may be that physical processes, like each other, and uniting according to degree of likeness, correspond

to psychically related phenomena. But this assumption is insufficient to explain the process in question mechanically. Association by similarity cannot be described in any such terms; the connections due to it are not produced by likeness of phenomena, but by recognition of such likeness. It presupposes consciousness, and takes place within consciousness; therefore its meaning is exclusively subjective. It is present only for and through self-consciousness; it must withdraw itself from objective view, even if this should embrace all processes in nervous substance which may be known externally. For this reason I call it *psychic association*. All higher mental and spiritual life, connected recollection, assimilation of ideas and formation of conceptions, the synthesis of conceptions according to content, are made possible by this; even memory on its psychical side depends on it. In the memory outer and inner association work together; the former reproduces ideas, by the latter they are recognised. Even the so-called mechanical memory, the involuntary reproduction that comes nearest a purely physiological phenomenon, stands under the influence of psychic association. When Hering ascribes memory to organic matter, as such, he uses a mere metaphor, or else he recognises a connecting consciousness also in matter. Reproduction, a general physiological law of nervous substance, means that definite states occur with increasing ease and accuracy as the result of constant repetition; but it does not mean that the repeated states appear as better known, *i.e.*, as more distinctly like previous states. An act of recollection is associated with every occasion of memory, and this lends a familiarity to what is remembered. In view of this fact, memory cannot be the cause, it must be the result of psychic association by similarity.

How can this anomaly be explained without taking refuge in a *res cogitans*? This is only an apparent

exception to the law that inner and outer phenomena are reciprocal. It concerns no phenomenon but the very ground of phenomena, the principle of all experience, the unifying function of consciousness. Psychic association is the result of this function. But we find that the unity of consciousness, though formally the basis of experience, is really connected with the individuality, and is dependent on this; pathological experience need not be the first to teach this. The substratum of the unity of consciousness is not to be sought in any organ, or in any point of an organ; the substratum for it, as has been shown already, is the organic individual, both as a whole, and in the reciprocal action of its parts. The organic equilibrium which, during the individual life, continually asserts itself in all change of matter and of energy, finds its psychical expression in a consciousness single by reason of its origin, and remaining like itself in all changes.

It goes without saying that the basis of phenomena cannot itself appear. The unity of consciousness cannot be perceived subjectively from within, any more than it can be perceived objectively; the mere ego is no object of knowledge, but its form. Only the effects of consciousness, psychic associations, can be found on the subjective side of experience.

This anomaly continues to have most important meaning. The fact which underlies all experience of the inner and outer world, the fact that the ego is not simple, but is single, and by its unity with itself recognises like as like, connects phenomena by their inner relationship, and so introduces among them an interconnection which could not be produced by their repeated appearance merely; this fact shows that we must regard the synthesis of processes in nature as far more intimate, as it were, more fundamental than would be possible if our standpoint were the purely mechanical, abstract view of nature. It proves more forcibly than

can anything else, the truth of what we have offered in this chapter to complement the mechanical view ; it proves that the mechanical relation is only the external phenomenon of the real, the effect of it on external sense.

CHAPTER III.

DETERMINISM OF THE WILL, AND PRACTICAL FREEDOM.

§ 1. MODERN astronomy, dating from Copernicus and Kepler, has the glory of having discovered the motion of the earth, and of having reached the true conception of the solar system; modern philosophy may claim to have discovered the laws of motion for the will, and to have reached the true conception of mind. Both discoveries, the astronomical and the philosophical, are turning-points in the scientific view of the world; the former is historically the most important element of the knowledge of the external world, the latter is the basis for the scientific grasp of the inner world, of mental life and its development. In both cases the true content contradicts the statement of immediate experience; the proof of this content means the triumph of thought over the original knowledge connected with sense impressions. Since the Copernican theory has been universally recognised, the rising and setting of the sun is indeed called a sense deception, though this phenomenon is necessarily valid from the standpoint of an observer on the earth. Absolute freedom of the will is also called an illusion, a deception of the inner sense, though the will must appear free to the actor, *i.e.*, from the standpoint of subjective experience. In order to distinguish the true from the apparent motions of the heavenly bodies, we must in thought exchange the geocentric standpoint with which perception is united, for the heliocentric; in order to see the dependence of the will on its causes, we must complement

subjective experience with objective. The freedom of the will is no illusion, but an incomplete, entirely one-sided view of the process of the will.

The new astronomical theory of the world has become common property of all the educated only after two centuries have passed, and after men have died as witness to its truth; nor is it difficult to understand why only the few who think philosophically have accepted the new view of the inner world of the mind. Abstract arguments are harder to understand than intuitive proofs; the weight apparently possessed by the witness of self-consciousness is felt far more than the meaning of an external intuition, which can be corrected by other intuitions that are external, *i.e.*, homogeneous with itself. Theology and jurisprudence unite in defending the freedom of the will; the former in order to free God from responsibility for man's sins, the latter to make man responsible for his sins against society. Although theology involves itself in hopeless contradictions with the omnipotence, omniscience and goodness of God, it chooses these contradictions as the lesser evil in preference to the apparently greater one of making the Creator responsible for the sins of His creatures. The theologian who candidly and fully confesses faith in the omnipotence and omniscience of God, must with Augustine and Luther cast aside the dogma of the freedom of the will, much as this may embarrass him, as it did embarrass Augustine. The jurist who thinks he needs the freedom of the will to justify human justice, as the theologian to justify the divine, must farther answer the question, With what right does he make responsible a causeless will, moved and to be moved by no motive, originating in perfect indifference? Pure will, will without motive or object, after it has been separated from the character of willing or acting individuals, is like the pure ego a formula, an abstract conception; it is, like the pure ego, exactly the

same conception in all acting subjects. But how can an abstract conception be endowed with responsibility?

Even the interest of morals seems to be united with the freedom of the will. So thought even Kant, who was entirely convinced that it was impossible to know empirically the freedom of the will, and who gave this conviction an unnecessarily bald expression. "Whatever metaphysical conception one may have of the freedom of the will, the fact remains that the phenomena of the will, human actions, are determined, like every other event in nature, by universal laws of nature." Here the specific laws of the will, especially the laws to be derived from the social order, are wholly confused with the universal laws of nature, from which they only mediately spring. "An original action, by which anything happens which did not exist before, is not to be expected from the causal connection of phenomena."¹ And yet in every next moment, as the universe advances in time, there is, in fact, something happening which did not exist before, even if its causes did. Morality stands, and determinism is a scientific truth, demanded by reason and confirmed by experience; morality must be possible, then, along with determinism of the will. As the result of a will acting under law, it is possible, we shall soon see, only in connection with determinism. Morality is the *ratio cognoscendi* of determinism, determinism the *ratio essendi* of morals. In other words, we could reach determinism of the will by inference from the existence of morality in human society, even if it were not to be proved by other reasons.

So our immediate concern is not to grasp the moral, still less the theological side of our problem. We begin by discussing it from the standpoint of the theory of knowledge. It is to be shown that absolute freedom of the will is a metaphysical imagination, without scientific

¹ *Werke*, vii. 317; ii. 427.

basis, without value for practical life. So far as the theological arguments are concerned, the remark may suffice that from the standpoint of the believer it must be called an unbounded self-assertion of the created toward the Creator, to put God under human, social conceptions of responsibility and imputation, to cite Him before the judgment-seat of theologians.

§ 2. Rée is in error when he assumes that philosophers have indeed proved that the will is not free but dependent on external causes, but have not answered the question why it appears free. Aside from Schopenhauer, who thoroughly investigated this point, Spinoza had already discovered the reason why the will must appear free. He says "that men must regard themselves as free because they are conscious of efforts of will and of desire, but do not even in dreams think about the causes by which they are determined to desire and will, because they know nothing of these." The idea of freedom is nothing but ignorance of causes controlling their actions. Men deceive themselves, Spinoza repeats, in the belief that they are free, for this belief only rests on the fact that they are conscious of their actions, but do not know the causes by which they are determined to action. Spinoza (in my opinion falsely) refers the origin of the conceptions of praise and blame, guilt and merit, to this necessary conception that men are free.¹ Schopenhauer, whose excellent treatise on the freedom of the will no one should leave unread who studies the question, no one may leave unread who would form a judgment on it, indicates, in his chapter "The Will before Self-Consciousness," the sources from which arises the phenomenon of an absolute inner freedom. For self-consciousness, *free* means simply *in accordance with one's own will*, and nothing more. This statement of self-consciousness is related only to the

¹ *Ethica*, Pars. I., Appendix ; Pars. II., Theorem 35, Scholion. Compare Rée, *Die Illusion der Willensfreiheit*, Berlin, 1885, p. 27.

freedom of *action* on the presupposition of willing. It means, I can do what I will, if I will, only presupposed that no insuperable outer hindrances oppose my action. So Hobbes understands freedom when he says that a free being is one that can do something when he wills to, and adds that freedom means absence of hindrances to action other than those involved in the nature and constitution of the acting being.¹ But the question is not whether action is dependent on will, but rather, whether will itself is dependent or independent? Our self-consciousness can offer no conclusion as to this. It stands by its uniform and essentially tautological statement; I will what I will, and I can do what I will. No one wants to know this; the question is, whether, in a given case, under definite conditions, external and internal, we can will the opposite to what we do will? There is no doubt that we can think the opposite as willed by us, and can even wish it. Our consciousness is ever occupied with the memory of past actions, their motives, and their results; the impulses of men are manifold and even contradictory, so that the full force of any inclination is not felt when we represent it to the mind afterward, but only when it acts immediately as a motive. This possibility of wishing the opposite, the uneducated man confuses with the possibility of willing the opposite; this, as Schopenhauer remarks, is the chief source of the undeniable illusion of an unconditioned inner freedom. Schopenhauer lays undue emphasis on the unchangeableness of character, and so perhaps undervalues the importance of this illusion, and its influence on future action. But important as the power to wish the opposite is, for education and for self-education, yet it is undeniable that wish does not itself become will, that no one is free to will what he merely desires.—Neither Spinoza nor Schopenhauer answers the question why the causes of our willing,

¹ Hobbes, *English Works*, iv. 373 sqq.

granted they exist, must constantly remain hidden from the standpoint of self-consciousness. As to that independence of external causes which would leave the will free, Schopenhauer does indeed remark that consciousness can make no statement on this point. Such independence would be outside the sphere of consciousness, in so far as it concerns the causal relation of the external world (given us as consciousness of other things) to our inferences. Self-consciousness cannot judge the relation of what lies outside its sphere to that which is within. The act of will is all that exists for self-consciousness, but it is only the external result which marks it for self-consciousness as an act of will.¹ In general this is true, but it must be extended and developed. Schopenhauer constantly confuses the object of will with its motive. His metaphysical theory, which regards the will as the essence of every phenomenon, leads him to treat the object as mere idea, the idea simply as motive of the will. He asserts that causality is essentially homogeneous at all stages of the phenomenon, so that he treats all causes as really motives—and this would be logical enough if all beings were endowed with will. Motives are never complete causes of willing, they are that part of these causes which actually falls within self-consciousness. If it were enough to know the will as governed by motive in order to know it as caused, then self-consciousness itself would teach the causal dependence of our expressions of will, and the phenomenon of freedom could only concern those non-essential actions, unimportant for self-consciousness, which, in fact, lack proper motive. The difference of aim and motive is clear enough in all cases of voluntary action. One might from gratitude set on fire his benefactor's house, so that the latter should get the insurance. The object of the will here, the aim sought in the action, is that the benefactor may get a sum of money; the motive

¹ *Die beiden Grundprobleme der Ethik*, Leipzig, 1860, p. 16.

is gratitude to him, and the means is setting fire to his house.¹ Except for those who, like Schopenhauer, regard objects as mere ideas, and ideas as motives, it is evident that insight into the motivation, even of all voluntary acts, would be insufficient to prove that these acts depend on the law of causation.

§ 3. The consciousness of the power or causality of the actor is necessarily connected with the consciousness of acting. This consciousness of one's own power, of the apparent originality of our actions, coincides with the consciousness that it is we ourselves who act, that we are the doers of what we do; it is one with this, and not an inference drawn from the perception of acting. Only by acting do we become conscious of ourselves. Self-consciousness is the most original and the most universal expression of our will; it is not added to the will to enlighten this, as Schopenhauer thinks,—it is the act of will as such; it is not to be separated from the effort for self-preservation, it is an active, not merely a receptive, consciousness. The active, not the receptive, side of our nature is the source from which self-consciousness comes, and comes constantly as long as we live. But the causes which set this activity in motion necessarily precede self-consciousness, because self-consciousness necessarily coincides with its effect,—the completed activity. So we only discover it when we turn from the subjective to the objective side of experience, from feeling and effort to sensation and sense-intuition. Our action seems to originate wholly with ourselves, because our self-consciousness originates at the same time with our action. This is why we are conscious of our reasons and our desires, but not of the causes on which our inclinations and desires depend; why actions which correspond to our inclinations must

¹ This example is presented and analysed by G. v. Gizycki in his valuable essay, "*Moralische Beurtheilung*," *Vierteljahrsschrift f. wissenschaftl. Philosophie*, ix. 1.

appear free. The causes of our actions, *i.e.*, the causes of our inclinations and desires, cannot come into self-consciousness, because in fact they lie beyond, *i.e.*, precede it. Only elements and parts of the total process forming our action come to the knowledge of self-consciousness. Therefore every action has about it something inconceivable from the standpoint of self-consciousness, something that seems beyond law, and on this the defender of free-will takes his stand and claims the witness of inner experience for his position. But now we see that this witness has not the force of proof, because it rests on an incomplete statement of facts.

We must, however, carefully observe that the consciousness of actions as performed by ourselves concerns only the form of acting. It is the way in which conscious action as such is performed. Out of this mode of action, Kant makes a special faculty, and calls it transcendental freedom. He makes the practical ego a thing, though he recognised that this hypostasis of a theoretical ego is nothing but a dream of metaphysics.

We distinguish simple conscious actions (actions from impulse) from those that are accompanied by the consciousness of freedom. The proposition that the causes of an action can never come into self-consciousness must be proved for each class.

An action from impulse is simply the satisfaction of an impulse. Though the consciousness of an impulse is constantly awakened by the feeling of desire, yet the self-consciousness of the animal is identified only with the satisfaction of impulse. Only this appears to the animal as his own action; but the feeling of want gives him a perception, however dull, of the external world, *i.e.*, of an existence limiting his own existence. The causes of impulse, and so the causes of action, are unknown to self-consciousness. An animal driven by hunger to seek food, knows nothing of the state of

the digestive organs which occasions hunger. If he could reflect, his search for food would seem to proceed from his own effort only, the causality of his action would seem to be shut up wholly within his own consciousness. The causes of impulses and their development can only be known to objective science. This alone can see that impulses are the subjective expression of life processes, and that their development and fixation is the result of natural selection.

In the case of a true action involving will, the idea of the results of impulsive movement intervenes between the feeling of impulse, and the expression of this feeling; the animal owes the knowledge of these results to its earlier experience. Voluntary action is action directed by intellectual activity. Actions which are in proportion, not merely to impulses felt directly, but also to the idea of the results of such impulsive actions, are voluntary. Proper voluntary actions involve that conscious choice between two or more courses suggested by impulse, which is called reflection; at least they involve the voluntary permission or omission of an impulsive action in accordance with results present to the mind. The reasons for this choice as they influence action, we call motives. The motive is not always the idea of the results of action; it may be the idea of a command, or, in the course of man's mental development, the idea of duty, in which case there is the very least reference to the results of action. Oftentimes the motive is a secondary impulse, subordinate to the primary. An action is more completely voluntary, in that degree in which motives or indirect impulses exceed direct impulses. The freer an action is, the more it is controlled by motive. We only feel the compelling power of the motive when primary impulses and passions are in opposition to it, and we feel it only so long as the contest continues between these powers within us. If this contest is

decided, in favour of inclination or of prudence, we feel ourselves again free (apart from subsequent reflection which leads either to remorse or moral satisfaction); our self-consciousness is wholly in harmony with our action. If now we consider that motives come from reflection, while reflection is an activity of consciousness, we see that our consciousness, being capable of reflection, must feel itself so much the more closely united with its actions, the more these are controlled by motive. These very actions, from the standpoint of external experiences, are most distinctly subject to the laws of causality, because, more than any others, they bear the external marks of a causal connection, *i.e.*, constancy and uniformity. We reckon upon, or, in ethical language, we *trust* the expressions of a reasonable will controlled by principles with just as great confidence as we expect the occurrence of a definite event in nature, where its conditions are given. Take an extreme case, the actions of an insane person, or of one who has lost control over himself. Which actions seem more distinctly free? those of the insane man, which from the standpoint of moral consciousness lack freedom, or those of the reasonable man, who is controlled by motive and is considered free? Do not the former seem inconsistent and unaccountable, do they not bear the mark of chance and disconnectedness, so that one who did not know their causes would be inclined to regard just these actions as uncaused? If the free will had any other existence than in the philosopher's imagination, these actions of the insane would be the type and the standard of comparison. A will deciding with complete indifference, *i.e.*, for no reason, must result in action entirely inconsistent and controlled by chance.—There is then a remarkable antithesis between the inner and outer standpoint for regarding actions. Actions which, judged from within, seem free, because they spring from the totality

of the acting subject, from the objective standpoint seem to be caused by reason of their regularity and constancy. Actions which from their inner constitution lack freedom, because they must be performed in passion, or in an abnormal state of mind, in external experience get the appearance of freedom or independence of causality.

We know the motives of voluntary actions, but not the causes of these motives. Explain an action by its motives, and it is as yet all unknown why just this representative idea, and not its opposite, was a motive for a definite individual in a given case, or why one and the same idea may in different individuals become different or even opposite motives. Why does a good deed suggest a feeling of gratitude to one, to another the feeling of poverty, it may be, and in consequence of this a dislike of the doer? Why is the idea of glory for some a mighty spur to activity, when it had no attraction for Descartes? Here evidently we strike the inborn nature of the individual, the peculiar connection of his inclinations and capacities which is very fittingly called *character*, and which precedes individual consciousness, for it is the underlying subject of this. It explains the different ways in which individuals react to the same external impressions. This secret source of our willing and acting is not directly reached by self-consciousness. We only learn of its existence indirectly through our actions; nor does this give us a complete knowledge of what it is, because we cannot be put in all possible circumstances of action. After a voluntary action has been explained from the motives, there always remains an inexplicable element not enlightened by self-consciousness. The links of causality are broken here, so that from the subjective standpoint the act cannot be understood. The reason why an idea is transformed into a motive lies outside of the self-consciousness which experiences the result of this transformation. It lies

in the unconscious depths of our individuality, in our natural constitution; follow the lines of objective study far as one may, in order to discover and completely know it, it constantly withdraws farther into the universal connection of things. A complete empirical proof of the causes of our actions is therefore not to be expected; this is the very last corner where the metaphysician could place his freedom of indifference, if this freedom were at all worth the trouble of asserting.

It is easy to see why the necessary ignorance of the proper causes of our actions must produce the illusion that they are not caused. We see that the same ideas as motives affect the will of different men in very different ways. Because the natural character can only be learned by indirect methods, and never completely, because we do not, as it were, have it right before our eyes, we imagine that the same ideas as motives might have affected our will in a way different and more in accordance with our desire.

Only he who regards his will as a primary being, will be offended if we assume causes of the will which do not originate in consciousness. The energy of our will, the strength of our passions, the firmness of our principles, the readiness to act, do not originate with ourselves any more than the energy of a thrown stone originates in the stone. Nothing is less in our power than the will. Certain pathological phenomena, called *aboulia*, forcibly confirm this statement. Men's concerns, general and particular, certainly would be better off to-day if will were a thing acting of itself. The conscious act controlled by motive, that last and highest development of social life, is possible for but very few.

§ 4. Self-consciousness may indeed recognise an act as not free, but only in the transition from impulsive to reasonable action. Because complete freedom of the mind, complete control of impulse by reasonable motives,

is an ideal that the individual can only approach, consciousness gives us actions both free and not free. However, it only recognises a lack of freedom in reflecting about past action, and not with reference to present action. We experience the conflict of motives with primary instincts and passions before we act; if we yield to such an instinct, and so set this aside for the time being, the power of the constantly active motive again asserts itself; afterward our action seems to have been determined by instinct and passion. We are not in position to recall to mind the whole power of those passions, and so the illusion arises that we might have acted otherwise than we did act and must have acted. The consciousness of inner compulsion or necessity is therefore a secondary phenomenon, the product of reflection, while the absence of compulsion is primary and essential to action as such. The absence of compulsion or necessity is no more an argument for freedom of the will than would be ignorance of the causes of action.

Hume himself showed that necessity is no essential attribute of a causal connection, and the absence of necessity no proof that such connection is lacking. So long as we consider the constant and uniform sequence of phenomena, we do not feel it necessary to think their connection in one way rather than in another. No more does this conception originate (I remark against Hume) in the habitual transition from the perception of a phenomenon to the idea of its cause or its effect. In order to get this feeling that everything in nature is necessitated, we must imagine some exception to the constancy and uniformity in the sequence of events. Unusual, apparently isolated phenomena, by their antithesis to such as are usual, and are normally connected, develop the consciousness that the connection of these latter is a necessary one. They awaken the impulse to a causal explanation, *i.e.*, they lead us to dispose phenomena in

the universal connection of things controlled by law. There is another proof for the same thing. Our common thinking is subject to normative laws, but we do not feel this as necessity so long as we think in harmony with laws. Only the discovery of a contradiction brings into our consciousness the necessary law of avoiding contradiction. In brief, necessity is everywhere a derived phenomenon arising under definite presuppositions. The subjective necessity in expressions of will becomes less evident the more necessary they are (in the objective sense of the word), *i.e.*, the more completely they depend on motives. The uneducated confuse this absence of compulsion with absence of causes for actions, and their ignorance of these causes confirms this opinion. In fact the connection of motive and action is as constant and regular as the connection of a physical cause and its effect. A motive follows law as much as a blow.—Hume, in his "Essay on the Human Understanding," chooses an instructive example to show how closely certainty in moral matters is connected with certainty in physical, and to show that the two together form one single series of inferences. A series of connected processes, partly physical, partly moral, is considered; and Hume shows that the mind can discover no difference in the necessity with which the one or the other kind of causes works. The whole series of causes, now physical, now moral, is treated as a single unbroken chain, of which each link is equally certain. In fact moral causes belong with physical, in a single causal arrangement of things. The difference is given only in the phenomenon, not for the mind which can abstract from the differences of the phenomenon.

§ 5. Ignorance of the causes of voluntary action is no proof that these causes do not exist. Freedom from inner compulsion is no proof that the will is independent of causal laws. The will must seem free to self-conscious-

ness even if it be causally conditioned. This is, however, no exact proof that it really is causally conditioned. Granted that the sun must still seem to rise and set, and the earth seem to be at rest, even on the supposition that the earth moves round the sun, it still remains to show that the earth does really move.

If we turn from the subjective study of willing and acting to the objective study of men's actions, we no longer doubt that these actions have causes, and that man's moral nature is under universal and fixed laws as much as his physical nature. We see human actions taking place with as great or greater regularity than the more complicated phenomena of nature, as soon as their conditions are given. History is on the same plane with meteorology, or even with biology, in that it has a causal basis. He who believes in free will does not allow this belief to lead him astray in judging the actions of his fellows, or drawing inferences from their past to their future behaviour. If in a given case his prediction of a friend's action is proved false, he does not make freedom of choice responsible for this; rather he ascribes his error to faulty knowledge of the character or circumstances attending the action of his friend.¹ Uncertainty in the prediction of a moral result, rests on the same basis as in the prediction of a physical result. Unknown causes may disturb the action of those known to us, and change or prevent the expected result. A motive follows law, but its effect may be changed by a counterbalancing motive. No matter how strong an emotion, it may be ineffective against fixed principles. The will is a compound process, dependent on the quantity and character of the elements which unite to produce it.

Our practical relation to our fellow-men, as well as our theoretical judgment of their actions, results from

¹ Pastor Waldemar Meyer, *Die Wahlfreiheit des Willens*, Gotha, 1886, p. 41.

the conviction that their wills are causally conditioned. What would result from the art of the educator and the politician, what protection would penal law afford if the will were an exception to the law of causality? How could we ask anything of a will indifferently free, or attempt to influence it with motives? The practical results of education and of politics, the actual protection given by penal law, are so many proofs that the will is not free. These results are indeed incomplete, but this only proves that our practical art is incomplete, and that the inborn natural character of men forms a limit hard, often impossible, to set aside. This is no proof that the will is free. An indifferent will would not be subject to guidance, and would render ineffective every influence from without.

This antithesis between our judgment of another's will, and the idea of our own, is evidently to be explained by the disappearance of certain obstacles which prevent one from recognising clearly that his own will is subject to the law of causality. We put ourselves at the heliocentric standpoint as it were, and as soon as we study the will from outside, we perceive its complete dependence.

§ 6. The hypothesis of the freedom of the will cannot be confirmed by experience. The witness of self-consciousness, which alone can be used to confirm it, is necessarily incomplete, and at the same time partisan. It cannot be used to explain human actions. Freedom is no reason by which an action can be explained, but the absence of a reason, the power to act without sufficient reasons: to postulate it of the human will means to renounce any explanation of the human will. An hypothesis which cannot be proved, and does not help to explain phenomena, is to be thrown aside, according to all rules of scientific proof.

In very many cases we can ascertain the causes of an

expression of will, and we are justified in assuming that this would be possible in all cases if we only possessed complete knowledge of the circumstances of an action, and of the character of the acting subject. This hypothesis is preferable to the assumption that the actor has a free will. By it we subject all man's action to the general laws of causality, we explain it as regular and definite, like all other events in nature. On the other hand, the hypothesis that the will is free, makes an exception to this law—and the only reason for it is that sometimes we do not know the causes of a voluntary action, and consider this ignorance of causes equivalent to absence of cause.

Free actions could not come into experience, even if they actually existed; the phenomena of the will must be in accordance with the law of causality, if the will itself is really free. In experience we find no absolute beginning, no phenomenon itself instituting a series of changes, *i.e.*, not unless another definite phenomenon has preceded, which it follows by regular rule. Voluntary actions by men or animals form no exception to the regularity with which definite sequent phenomena are connected with definite antecedents. We see them occur with the same regularity with which every other process in nature happens, as soon as its conditions have become complete. Because they occur regularly, as experience shows, they must occur necessarily. A sufficient reason, and a reason that makes the result necessary, are one and the same thing.

As reflex action follows stimulation, so instinctive actions follow the recognition of a stimulus, and voluntary action follows the mere idea of such stimulus. Nor is the nature of this dependence of animal movement on cause, changed with the increasing complication of the causes. As Schopenhauer rightly says, "the abstract motive, consisting of a thought, is an external cause

determining the will, as well as the concrete motive, consisting of a real object"—we might add, as well as the stimulus which occasions a reflex motion without itself coming into consciousness. It is not yet necessary to consider the distinction between a voluntary motion and a reflex, if the connection between them is granted, and if it is admitted that no sharp line between them can be discovered from the standpoint of objective experience. Voluntary motion presupposes instinctive or automatic, and this presupposes reflexive. The highest form of animal motion involves both the lowest forms. Even anatomically, the course for will-impulses coincides for the most part (in spinal cord and medulla) with the course for reflexes. If an idea is to become a motive, it must first stimulate consciousness in the form of pleasure or pain. It owes its influence on the will, not to its thought content, but to the feeling which this content awakens; and the motive power of this feeling comes originally from the external impression which changes the nervous substance, and precedes the formation of ideas. From the objective standpoint, there is no essential difference between an animal motion occasioned by an idea, and another occasioned by external stimulus. We conclude from this that there is no essential difference between the two, in reference to the causal dependence of the two motions.

§ 7. The philosophers who have most carefully studied the freedom of the will, have recognised that it involves something inconceivable, and have stated this most clearly. Kant treats freedom as "intelligible," which is his expression for unknowable. Its existence seems to be demanded only by practical needs; theoretical reasons are insufficient either to show its reality "as one of the powers, which include the cause of the phenomena of the sense world," or even its possibility. The pure reason can do nothing more than prove that "nature at least

does not by freedom contradict causality." But Kant was not even able to prove that freedom was compatible with the absolute causal connection of events in nature. The causes of human action cannot, as he thought, be completely given in the phenomena, while at the same time the actions depend wholly on the free will. The principle of non-contradiction stands in the way of such an assumption. If we could find place for the existence of freedom, it could be but one part of the causes of our actions. But then it must have a definite quantity in every given case, *i.e.*, it must belong to the sense world, which contradicts the very idea of freedom. Schopenhauer, who shows the necessity of all actions more forcibly than any other thinker, unless it be Hobbes, regards it none the less necessary to believe in freedom of the will. He makes this freedom transcendent. For him it is no longer the capacity to originate a series of changes, since it lies outside all time and change, and therefore outside the sphere of all active influence. Accepting the scholastic proposition, *Operari sequitur esse*, Schopenhauer localises freedom in being, necessity in acting; which, applied to men, leads to the strange conclusion that every one is the originator of his character, *i.e.*, of the natural constitution innate in him. In order to be free, so Schopenhauer says, man, the individual man, must have existed before birth. The reader can but recall the myth in the tenth book of the Republic, in which is depicted the choice of characters and lots for life, before entrance into life. The conception floating before the minds of these thinkers, which they falsely transfer to man and his natural constitution, is the conception of a metaphysical freedom; and this freedom is to be understood purely negatively, not as cause but as absence of cause; farther, it stands related exclusively to the being of things in general. The being of the world would then be denoted

as free, in so far as the world's existence has no cause, in so far as the world is not thought to have been created. But this metaphysical freedom can only be ascribed to universal being, not to nature as a distinct form of being, and still less to the natural constitution of a man, that exceedingly complicated phenomenon. Like other philosophers who have concluded from responsibility to freedom, Schopenhauer has neglected to show with what right and with what result a free being is made responsible. It is generally accepted without question that responsibility is conceivable only with reference to free beings. On the other hand, it is wholly beyond comprehension that any real decision of the will can be imputed to a free being, a being whose actions do not depend on anything, and therefore do not depend on the consciousness of responsibility. We only get into trouble the more deeply by shifting responsibility from single actions to the constitution of the will as a whole. If there is to be a free choice of character, it must take place without cause and without motive, for a motive would already presuppose a character of definite constitution. Such an uncaused choice would be wholly accidental, and no one can be made responsible for an accidental occurrence which does not deserve the name of an action.

Thus inconceivability lies in the very idea of freedom. To conceive means to know through causes. The absolutely uncaused, the metaphysically free, cannot therefore be conceived. The latest attempt to make freedom conceivable is also shattered on the impossibility of squaring the (philosophical) circle. If Delbœuf had investigated the relation of freedom to the principle of causality, instead of to the principle of the conservation of energy, he would himself have found that his hypothesis was insufficient to make freedom any easier to understand. According to Delbœuf we must think the animal being

as furnished with the power to determine the time when voluntary actions occur, but without the power to determine the direction and intensity of these motions, since this last would contradict the principle of the conservation of energy.¹ But grant that it be possible to separate the time occurrence of an action from its other determinations, spatial and dynamic (and this is impossible), yet this would not prove animals free, still less make freedom comprehensible. The question would remain open whether the use of this faculty asserted by Delbœuf, the choice by an intelligent being of the time when an action shall occur, is in harmony with the law of causality or not, whether it results from a cause or not. The former alternative is conceivable, the latter, and this alone is freedom, is wholly inconceivable. The delay or omission of an action can only be explained by a motive which is effective in the consciousness of the acting subject, and which makes necessary one conclusion or the other,—at least Delbœuf does not make the slightest effort to prove the contrary. Under definite presuppositions, the delay of an action demands energy as much as the action itself. If by the principle of the conservation of energy the latter is a mechanical phenomenon, not subject to caprice, so is the former. Delbœuf's assertion that voluntary actions break the continuous chain of mechanical events, in that these are not to be directly deduced from motions immediately antecedent, is only apparently correct. The motions which really immediately precede expression of will by an animal or a man are wholly unknown to us. They take place within the animal's body, and are under the influence of previous actions by conscious beings. What is known to us of these actions is only the part which falls within external experience. No wonder then if we are not able to deduce the mechanical phenomenon

¹ *Déterminisme et liberté* (*Revue Philosophique*, 1882, Nos. 5, 6, and 8).

of an expression of the will from those parts of the external causes which are known to us. Here the knowledge of the psychological causes of action supplements our fragmentary knowledge of mechanical causes. How could Delbœuf assert that expressions of will cannot be predicted? On the contrary, they can be predicted with great certainty, and our practical relation with conscious beings, especially with our fellow-men, rests wholly on this assumption. Without this, training and education, the work of statesmen and administration of law, would be impossible things. For ordinary experience, less uncertainty exists in the moral world than in the physical, yet no one doubts that every physical process is causally conditioned.

The hypothesis that the will is free does not merely mean an exception to the principle of causation in its application to experience. It is also in contradiction to the universal logical law of thought. It is equivalent to the assertion that the identical is not identical, that one and the same process can at the same time be a different, opposite process. This refutes the hypothesis, so that it is unnecessary to inquire how far the principle of causality reaches in experience.

The causes of an effect can only be separated from the effect in thought; in fact they form a single process together with the effect, and because cause and effect are one and the same, the process cannot be other than it is—it is what it is. The effect is no new fact which would be different from the complete cause, *i.e.*, which must be added to the cause after this has become complete. It is the totality of the causal moments, expressed in this form; it is the connection of these moments, it is that synthetically which analytically is the cause in its elements. Cause and effect are not to be considered as two facts, of which one could be given without the other; they are but one fact, which is absolutely what it is, *i.e.*,

which must be identical with itself. The complete conditions of an action, the physical and mental state of the acting subject in connection with the motives of his action, and the action itself, form a single indivisible event. The action is not added as a new event to the totality of its conditions. If the conditions have become complete, the action does not then result; it is given. That it begins in time is due simply to the fact that its conditions, which partly belong to the external world, partly to the internal, are conceived as developing in time. Only the connection of these conditions occurs in time; the moment when the conditions are united is the moment of the action itself. If two opposite actions of one and the same subject are possible under conditions exactly the same, as the free-will hypothesis asserts, it must also be possible for one and the same process to be and not to be at the same time, for a process and its opposite to occur at once; A must at the same time be non-A. Different times cannot exist at the same time, nor different actions of one and the same subject at the same time. They must be in different times, but then, by reason of the development of things in time, the circumstances of the actions must also have changed, and the difference of actions is only the result and expression of this difference of their circumstances, not a result of the actor's free will. Either this subject or the causes of his action must become different, if the action itself is to become different. Under given conditions, for a given subject, only a single action is possible. To assume the opposite means to deny the principle of non-contradiction, for cause and effect cannot be separated. Freedom of the will is not merely an inconceivable or transcendent Idea, it is self-contradictory, and therefore impossible. The principle that like actions of one and the same subject correspond to like circumstances, different, to different, is an immediate result of the principle of identity.

In our thought, the conceptions *cause* and *effect* assume a different position, and are distinctly separated. Thinking puts sections, as it were, through the continuous course of processes; it bids this course stop at a point arbitrarily fixed; with reference to a definite event, it designates what precedes as the cause, the event itself as the effect. Actually there is but a single connected course of events. The world is present but once in time. It must be present more than once if two opposite actions of one and the same subject are possible at the same time. Every act of a free will would double the world in time. As the result of such an act, that which happens and its opposite must happen at the same time. If the objection is raised that this is manifestly impossible, but that the hypothesis of free-will only asserts that two opposite actions of one and the same subject would be possible under the same conditions (even if this involved making time twofold), then the will is determined and no longer free. The will is made subject to time. And if it is subject to time, it is subject to events in time (for time itself is but a mere abstraction, the idea of the form of events in it).

§ 8. All that happens, great or small, happens with like necessity. It cannot happen otherwise than it does. Past and present action is determined, future action is predetermined. Though this necessity lays no external compulsion on action, it seems to lay so much the more inner compulsion on our spirit, especially when thought is turned toward the future of man's action. Predeterminism of what is to happen not merely excludes free will, it seems to make will superfluous, *i.e.*, it seems to lead directly to fatalistic consequences. If the spirit scarcely takes offence at determinism of past action, because it rests in the impossibility of undoing what has happened, it strives so much the more earnestly against recognising the predeterminism of future action,

yet the two, determinism and predeterminism, are not to be separated. Actions which are evidently determined, as we look back on them in the past, were once future, and as such predetermined. From still another standpoint, it is difficult for feeling to be reconciled with the necessity of all events and actions. For feeling it must seem that all actions have the same importance if they occur with the same necessity. Does not experience teach that there is a distinction between actions with moral import, to do which we feel a command within us, and expressions of the will which seem indifferent? It is easily granted that it does not lie in the power of every man to perform a magnanimous action toward an enemy, for this would oblige him to overcome too strong selfish motives; how does it always lie in our power to go to the right instead of the left?

We do seem to possess a freedom of indifference for indifferent actions. For this reason those who defend freedom of the will usually confirm their assertion by indifferent actions, such as stretching out one arm rather than the other. They fail to see that they are degrading the moral actions which they would prove free, and toward which we are anything but indifferent, by bringing them on to the same plane with those indifferent actions for which the illusion of freedom is strongest. It is easy to show that the illusion of uncaused actions in indifferent cases does deceive us. If I rise from a chair to show that the will is free, I have proved the opposite, the necessity of acting from motive. If I rise from my chair without knowing why, the cause was scarcely observed, perhaps not coming into consciousness, whether it be the feeling of a certain discomfort in my previous position, or only the impulse to move which determined me to act in this way. There is a good deal of meaning in Rée's account of a left-handed defender of the freedom of indifference, who stretched out his *left* arm to

prove his thesis.¹ Nothing in reality is undetermined, and everything that happens is predetermined, even the process which seems least important is the only possible one under the given circumstances. Experience and reason teach us that it is produced by the causal connection of things. It is not indeed necessary to believe that for this reason the whole force of the universe must be active in every single process, that the whole development of things finds its goal in this process. The world must have been from its beginning something very different if the least event in it were to happen other than it has happened. The universal being and course of events is one; this unity is involved in its very conception; the necessity of every process in nature is but another name for this unity of its being and of the course of events. And who can say what process is insignificant? What a chain of results may depend on the mere choice of a path, how many members must oftentimes be separated from this chain, how much driven from the world, in order to substitute the opposite for a choice actually and necessarily made? William James asks whether the world would be less rational if such actions as the choice of a street were left wholly to caprice, and he thinks the question cannot be answered.² Yet we may decide this with certainty. Infinitely small as imagination may make the difference of such a world from ours, for the understanding even an infinitely small variation from the law that every event is determined, from the universal law of causality, would be a miracle infinitely great. From the power to do apparently unimportant actions with absolute freedom, would proceed the power to reverse the course of nature in constantly widening circles. A single element of irrationality, an exceptional event that is uncaused, must in its results

¹ Rée, *Illusion der Willensfreiheit*, Berlin, 1885, p. 16.

² "The Dilemma of Determinism" (*Unitarian Review*, Sept. 1884).

make all nature irrational, as a very little leaven may set a whole mass of organic matter in fermentation. Nature could not exist along with a freedom not subject to law.¹

But how can predetermined action be real action? Does not action lose all meaning if everything that is to happen is predetermined for the whole future? Apparently predeterminism of all future action can only be asserted at the cost of fatalism.

Man with his insight and his will belongs to the arrangement of things which is predetermined, and the regularity of which is the expression for the constancy of fundamental qualities and relations of things. In calculating on future events, man and his reasonable action must be taken into account. How can an arrangement appear to man as a fate foreign to his nature, and imposed on him from without, when he with his whole being forms a part of it? how can he think himself limited by it, when he could not be what he is without it? With the same necessity with which he exists, he exists as the intelligent and purposeful being in nature, which he recognises himself to be. The laws of nature are not laws given him, laid on him from without; he himself is the natural activity of Law on the highest plane of development yet reached on this planet; his future is the future of nature, which continues its work, not against him, but through him. An order which necessarily involves the existence of intelligent and purposeful beings like man is no order which should appear to an intelligent being, conscious of purpose, as an external fate. The natural process against which short-sighted man rebels necessarily carries with it the logical, the moral, the beautiful, all that toward which the will of man is directed, all which satisfies and inspires his spirit. One can but agree with those thinkers who

¹ Kant, *Werke*, ii. p. 358.

regard the spirit and its reasonable demands as possessing equal authority with the discursive understanding for the interpretation of the world. But in order to reconcile our moral consciousness with the course of events, it is enough that the same laws of nature which occasionally bring evil also serve to develop the good; that the same laws which under special conditions produce illness are the very laws of health; that evil carries in itself the germ of its own extinction, and sooner or later must destroy itself by its own consequences. Only the man who sets aside transcendent hopes and wishes, not with resignation, but with inner satisfaction, feels himself at home in nature. He knows that the force with which he combats evil is natural, not supernatural, that the laws of the good are the laws of development, advancement of life, and progress; and in this knowledge he knows himself one with nature and with life.

It is certain that the future of things is pre-established by their past and present, certain that they could be predicted if the quantities for this calculation were sufficiently known; but that which has pre-established them is a power kindred with human reason, for it has created this reason: that which calculates this power is the human mind, which finds out the order of things, and by its foresight becomes itself a cause of their future form. External, purely mechanical consideration and calculation of events would indeed never find understanding and will; and the reason is not that understanding and will have no power to affect the course of events, not that things would develop just as they do without these, but rather that the understanding cannot consider itself at the same time with other objects. The phantom of Laplace, the oft-cited bugbear of fatalistic mechanism, would by no means embrace in its world-formula the whole history

of mankind, with its Ideas, its errors, its battles and its sorrows, its defeats and its victories, its progress to the better—it could never even suspect the existence of such a history. Instead of actions, it would only see motions. Only inner experience teaches it that some of the motions which it calculates are actions of intelligent beings, and directed by consciousness, that in a certain sphere the mechanism of things means at the same time the spiritual development of things, and that the same thing which is represented to outer senses as motion, reveals itself to the self-consciousness of a reasoning subject as decision by the will.

The fatalist separates the will from nature and believes that the order in the sequence of events would be fulfilled without his will, just as it is with his will. He considers that this order is as external to him and to his will, as if he and his will did not belong to this order. In a word, he believes that the will has no effect; it is unimportant whether in a given case he wills or not, because in his opinion what must happen, happens without aid from his will. On the other hand, the indeterminist asserts that the will has no cause. He regards the will as a *causa sui*, and believes in absolute, not merely in relative spontaneity of action. Determinism stands in contrast with both theories, and teaches that the will both has causes and produces effects, that it forms a part, and an essential part, of the universal causal connection of things. The fatalistic theory is essentially as dualistic as that of the indeterminist. Like this it separates his will from the order of things; the only difference is that he subjects his will to this order with resignation, while the indeterminist tries to make it an exception from this order. The fatalistic belief and the resulting avoidance of action is indeed necessary and unavoidable on certain presuppositions, especially as the result of definite race-pecu-

liarities and influences of culture, like the oriental. But he who sees the deceptive side of this belief cannot let it influence his action. An hypothesis which explains the origin of erroneous views, is far preferable to one which only knows the reasons in its own favour.

Fatalism is a motive not to act; determinism, the strongest motive of action; indeterminism, a source of foolish complaints against one's self, of idle wishes that one had acted otherwise than he did.

§ 9. What always produces the confusion of determinism with fatalism is a certain widespread view of the reign of law in nature, which really gives these laws being and makes them *things*. In explaining processes in nature, we use laws as major premises under which we subsume facts, to reach conclusions. This procedure readily produces a sort of illusion by suggesting that the laws really precede the facts which happen according to law, that they are independent of these, and prior to them. Because we make laws the major premises for our conclusions, we think that they take a similar higher rank above phenomena themselves, and our belief is confirmed when we reach laws not by mere abstraction from phenomena, but by analysis and reduction of these. By this false conception the real is as it were doubled for our mind. We separate the laws of processes from the processes themselves, and forgetting that they but express the constancy of the attributes of things, and the resultant uniformity of their action under like conditions, we represent them as giving direction to things and compelling the course of phenomena to take one definite line. Aristotle's remark of the Platonic Ideas that they were the things of sense posited a second time, applies with but little change to laws, as ordinarily conceived by the natural scientist—they are the real processes posited a second

time. The objective world and its obedience to law are not two separate facts, but a single fact expressed in two ways, according as it is related to sense intuition, or to logical thought. There are not first laws, then things and processes subject to them. Laws are the relations of things, the forms of processes thought under generalised or simplified circumstances.

That phenomena obey law is in the first place a postulate of the knowledge of nature, the regulative Idea by which this knowledge is directed. Any exception to it is excluded from the sphere of knowledge, because it always remains possible and necessary for reason to explain an apparent exception by the concurrence of several laws. The mind is the proper lawgiver for nature; but it gives nature no other laws than such as nature would follow under the conditions it fixes, and does actually follow, so far as these conditions are realised, or are established for the sake of experiment. If, for example, I state the consequence of determinism, that two men exactly alike under circumstances exactly alike must act in the same way; or that the same man placed a second time in the same circumstances will act as he did before, I only assert the normal regularity of human action. I do not say that there are two men just alike, or that the same circumstances recur. That assumption, though imaginary, is not at all absurd, no more so than the assumption of a gas exactly following Mariotte's law, or of an exactly spherical planet. Such assumptions are ideas used by science to express its conviction that all phenomena follow law. The nearer experience comes to such an assumption, the nearer it coincides with the consequences deduced from the assumption. Do not men act very much alike in like circumstances? Then they must act in the same way, under the same circumstances. One thing can be asserted as a real fact, and not merely as a principle of

investigation: namely, that every process in nature is fully determined by the special accompanying circumstances, and in so far necessary.

The complete causal definiteness of all that occurs and is done, future, present, and past, by no means makes the world a mere play of repetitions. It does not exclude, but includes change and progressive development, as Galileo's law of persistence does not exclude motion in a curved line, but applies to its components. New mental creations no more contradict this conception than do new combinations of material elements. Leibnitz's proposition as to the identity of indiscernibles, which denies repetition of the identical in nature, applies rather to the development of things in time. No point of time with its content is exactly like an earlier or a later point.

The obedience to law, which determinism ascribes to action, is not a blind, but a discriminating obedience. It is in form a creation of the mind, which makes action itself an object of investigation.

§ 10. The defender of freedom of the will does not know how dangerous the freedom would be which he ascribes to man. What seems to him a good, would really be an evil, worse than any real evil which can come to man. If nothing determined the will, and the will determined itself by nothing except itself, then sympathy, duty, the idea of the good could not be determined, and even the consciousness of responsibility, which is constantly invoked to prove freedom, must lose all influence on it. To be able to decide between A and non-A without any motive, would be, in Schelling's words, in truth, only a power to act unreasonably.¹ So Lessing² and Giordano Bruno treat freedom not as an

¹ Schelling, *Philosoph. Schriften*, 1809, i. 463.

² *Vorrede zu Jerusalems Aufsätzen. Werke*, Berlin, G. Hempel, vol. xviii. p. 243.

excellence, but as an imperfection; so the latter ascribes freedom to man, to God necessity.¹

With the *liberum arbitrium indifferentiæ* man cannot begin the least thing in the moral or in the physical world. If this imagined faculty really exists, if every expression of will is not fully determined by its causes, namely the character of the actor and his conscious motives in the first instance, then every one of us must tremble before the thought of his own actions in the next moment. How could he trust the power of his character, the fixedness of his principles, unless character and principles control the will, and make action necessary? Man's physical life is exposed to much which seems unimportant for him and for his ends; indeterminism would expose our moral life to chance, to a change, not merely apparent, but real. If the objection is made that determinism makes evil necessary, and sometimes unavoidable, the other side of the picture is forgotten, that it makes good necessary, *i.e.*, alike unavoidable under definite psychological conditions. If the evil is not necessary, no more is the good; and in a world in which every action, even that of the obdurate murderer, cited by James, were not necessary, there could be no further occasion for a good disposition and uprightness. Is morality denied if one asserts that it is the necessary product of human nature, and that its constantly progressing development is the result of our social life with our fellows, and if one regards its extension as the necessary sequence of the increasing power of the universal will over the individual? It is denied if it is handed over to indeterminism, to absolute caprice, and so to absence of law and to chance. So we may say with Lessing, "Determinism has nothing to fear from the side of morals."

¹ Brunnhofer, G. Bruno's *Weltanschauung und Verhängniss*, Leipzig, 1882, p. 273.

§ 11. But—responsibility, guilt, merit, these moral powers of social life, are they not proof that the will is free? Is not Kant correct in regarding absolute spontaneity as the proper ground of imputability? How is an action to be charged against any one, and the actor be held responsible for it, if it must happen, and must happen just as it did? Is responsibility compatible with determinism? I ask again, How could it exist with indeterminism, how and for what can a free will be made responsible?

Beings not free, it is said, are not responsible for their actions—and, for the time being, this assertion may stand. But it is even more certain that free beings, whose actions occur without necessary causes, cannot be responsible. Supposing the will is free, the subject has no responsibility. Who is to be made responsible on this supposition? The character of the actor? That cannot be the cause of the action if the will is really to be free, free in the sense of indeterminism. The circumstances of the external world? They belong to the external world, and are governed by its laws. Perhaps the motive, *i.e.*, the mode in which those circumstances affect the actor? But this mode itself evidently presupposes a predetermined character of the actor, because it betrays the essential constitution of this character even more immediately than the action itself. A free being can have no predetermined, no definite character, for the most essential mark of character is persistence; but a free being can change his character constantly, and without reason. If I attempted to make such a being guilty of an evil action, and give him credit for a good one, he might meantime become a different being.

This seems to be an antinomy of the practical reason: Responsibility, an unquestionable fact of consciousness, is not possible on the supposition that the will is free, or that it is not free. The difficulty of solving this

antinomy is the sole reason why the question of freedom has not been settled. For it may be shown absolutely and easily that determinism alone agrees with the universal principles of knowledge, and is even demanded by these principles. Farther, we know at least an essential part of the causes of every true action of the will that proceeds from us, the conscious motives; so we should be the last to doubt that the will is conditioned by causes. If anything is determined, the will most certainly is, for motives may always be found as its causes, and our impulse to search for such motives is even more original than the impulse to discover the causes of a process in the external world.

The easiest way out of this dilemma would be simply to give up responsibility in view of the necessity of all actions, *i.e.*, to say that while the will is determined, the feeling of responsibility must be an illusion. Rée has in fact taken this course. How is it, he asks, that men are accountable for necessary actions? and answers: Man does not see that actions are necessary. Proof: As soon as he recognises that they are necessary, he ceases to reckon guilt or merit. Responsibility is immediately given, he continues, freedom mediately, *i.e.*, it is reached by inference from the existence of responsibility. But in order to explain responsibility, there is no need of the assumption that actions *are* free; responsibility is explained by the fact that one *regards* actions as free. Kant thought that all men see the necessity of actions, and impute responsibility in spite of this, therefore they *are* free. In fact almost no one sees this necessity, and therefore they feel responsibility.¹ Though much may be said in favour of this argument, and without doubt the consciousness of responsibility experiences a change as soon as insight into the necessity of action has reached the power of a practical conviction, yet Rée can only

¹ Rée, as cited, pp. 42, 49, 54.

explain the continuance of this consciousness as the result of habit. Kant and Schopenhauer are nearer the truth when they teach that he who sees the necessity of actions, still feels himself responsible for them. The consciousness of responsibility for voluntary action is as immediate and necessary as the consciousness that the action of the will is determined by causes. One may refuse to see this necessity, but he cannot drive it from the world except when something interferes with the causes that produce the feeling of responsibility. The moral invalid is not sensitive to this feeling.

To me the fact is beyond question, that indeterminism and responsibility absolutely exclude each other; at least I have never found proof, but only assertion of the opposite. But if the actual coexistence of determinism and responsibility which are both alike true and real, is to be made conceivable, responsibility must be independent, in origin, of the real or supposed freedom of the will. In other words, actions are not responsible because they come from a free will, nor irresponsible because the will is not free; responsibility has nothing directly to do with the question as to freedom, or with the decision of this question. Now, I assert that a being who knows himself to be responsible, is by this very knowledge responsible. He thereby makes himself responsible. Knowledge and being cannot be distinguished here, where a purely psychic fact is concerned. Certainly no one has the power to produce or to change the knowledge that he is responsible. Every one must know himself responsible under definite circumstances; the causes of this knowledge no more come into consciousness, are no more a matter of caprice, than the causes of his will. Even that philosopher must know himself responsible, who, with Rée, thinks he can bring to an end his knowledge of responsibility by an understanding of the necessity of his action, and who explains

it as a residue from habit if it still continue. As this knowledge of responsibility becomes more and more complete, he learns that it is one of the weightiest causes of correct and upright action, that it produces caution in unimportant matters, careful investigation of results in those more important. Then he is not simply obliged to know himself responsible, he wishes to. The knowledge of his responsibility, which for psychological reasons is an element of his human self-consciousness, and not to be separated from it, becomes an element of self-consciousness for moral reasons also. It appears in the series of motives governing his action, *i.e.*, in the determinism of his will.

As long as we limit our view to the individual psychic life of man, or think that this life may be separated from the psychic life in and through the community, we cannot expect to understand the reasons for this consciousness of responsibility. Responsibility is a phenomenon of social ethics, and as such it is to be explained by social psychology. Individualistic psychology must pass helplessly by phenomena of the mental life, like duty and responsibility, which originate not in the single consciousness, but in the consciousness of the community. The metaphysical hypotheses by which it attempts to explain these phenomena make them no clearer. The principal hindrance to an understanding of mental life lies in just such hypotheses, *viz.*, in the conception of soul as substance, in such wise that single portions of consciousness may be isolated like atoms. He who makes independence of substance a barrier between the centres of psychic life, cannot rise to the recognition of a mental life reaching beyond the individual—though he see its results in all that man does in his essential union with his fellows, in all that he draws from the consciousness he shares with others—in language, art, and science, in religion and morals. He who separates

men from each other psychically, as physically they stand over against each other, and treats psychical being and action as attached to the body of the individual, or even to some point in that body, shuts his eyes to the reality of the universal mind above the individual, the real subjects of which are not individuals as such, but the bonds uniting individuals. The sight of individual men obscures his vision for mankind. Logical thought in its normative meaning, he can understand as little as the moral will. A sort of superorganic life has developed out of the organic; the first step toward it is the family; the individual forms a part, an organ of this. The process of this life does indeed develop out of single psychic unities as the process of organic life out of single cells, but it reacts again through its total effect upon each individual psychic unity. The psychic life of man awakens in contact with the psychic life of his fellow-man; his course of thought is regulated by that of his fellow-men, his will by the will of those with whom need and similarity of being unite him. This association of man with his fellows is no aggregate, in which the individual keeps his own being unaltered, but a system through which he acquires attributes that he could not get outside of it. The older psychology expresses only a correct observation when it distinguishes higher and lower mental faculties, understanding and sense desire on the one hand, reason and will on the other. What it calls higher mental faculties, and falsely regards as powers of an individual soul-substance, are the mental faculties acquired in and through the community in distinction from such as do not differ essentially from the corresponding faculties of animals. The man thinks his thought, and subjects it to norms universally valid; he judges his will, and recognises that it is bound by moral laws. He lives a double life, his own, and a social life. And he shares the social, general,

human life, before he reaches a fully conscious individual life. Therefore his personal life is in its origin subordinate to the social, and the expression of this subordination in the direction of the will is the consciousness of duty and responsibility.

We are not responsible to ourselves, but to society; as we are originally made responsible by society and its organs. Responsibility is the reacting judgment which proceeds from the community in which we live, on the social results of our action, and farther on its motives. Made responsible for our actions by society, we continue to feel ourselves responsible. We continue to judge our actions, their results and their motives, because from the beginning of life we have been judged by the community to which we belong. If we feel ourselves responsible for the disposition that remains hidden from our fellow-men, we put ourselves in thought before an ideal community or ideal person, who, we imagine, knows our motives and approves or condemns them. We separate knowledge of our motives from judgment of them, and pronounce the judgment over them, as it were, in the name of a higher power. Thus necessary to the consciousness of responsibility is relation to a second subject.

The individual will is in fact directed by the social will, first externally, and as the result of this internally; commands and prohibitions, advice for or against, do not continue without influence upon it. And as encouragement and dissuasion are related to actions just about to happen, so the resulting responsibility is related to future action. Actions which for the present are commanded or forbidden, for the future are under control of responsibility. We feel responsible for present action because it was future, and was under a lawgiving will. Command and prohibition are transformed into responsibility, from the standpoint of the future. The

transformation of external into internal responsibility, the transformation of "forensic" responsibility, which concerns the results of actions, into moral responsibility which reaches to our most secret feeling, and even to wish and thought, answers to that farther development of social life, which everywhere shows that psychical unions tend to become more intimate. We need not see anything mysterious in this.

The universal will, the will of the community as such, which makes duty and responsibility for us, is our own will; its apparent heteronomy is in truth the autonomy of our moral personality; we ourselves as members of the community are subjects of this will. "The moral ought," says Kant (*Grundlegung der Metaphysik der Sitten*), "is properly a willing,—one's own necessary willing." But when he adds "as member of an intelligible world," we choose instead the ground of experience, which alone affords sure footing for practical philosophy, and say "as members of a super-individual community, the family, state, mankind."

Actions involve responsibility by reason of their social results. These results, however, remain the same whether the actions spring from a will free or not free, therefore the reaction of society toward them must remain the same. Speculations as to freedom or determinism of the will are not to be expected in the beginnings of social life, but one would search in vain for a social union, be it ever so primitive, in which the members of the union were not to some extent made responsible for their action. From this it follows necessarily that men originally imputed responsibility for actions, not because they believed these actions were free, but because they found that the effect of them was injurious to the interest of the community. Shall we now cease to impute responsibility because we have learned that actions are necessary? even if this feeling

of responsibility is a cause of the future willing and acting of men, if it is the necessary product of the psychical interaction of members in a community, if it be one of the causes that determine the will of the individual? How can determinism contradict responsibility, if responsibility is one of the determining causes of the will?

The reaction of the community toward the actions of the individual precedes the development of his self-conscious will. It is one of the chief means of making the individual into a being which acts from conscious motives, *i.e.*, a being which not merely knows the motives of his will, but judges, approves or condemns them—a being which wills to do or not to do. Responsibility is a cause, not a result of man's moral personality. Man is not made responsible because he is at birth a moral being, he becomes a moral being because he is made responsible. Out of duty and responsibility there first arises a moral consciousness for the individual. Instead of deducing duty from man's moral nature with Kant, one should rather deduce man's moral nature from duty laid upon his will by the will of the community, and from his responsibility for his own actions.

The subject of responsibility is the acquired moral character of man. Actions are imputed as responsible, in so far as they proceed from a character which was first created by imputation and responsibility. There can be no doubt as to the justice of this, difficult as it always may be to decide the question of responsibility in a definite case.

§ 12. Determinism is the true basis of practical freedom, the presupposition on which this freedom is possible. Practical freedom means *negatively* that the will is independent of compulsion by sense impulse, and *positively* that it is dependent on absolute self-conscious motives. If these motives are at the same time universally valid,

if they proceed from the universal interests of the will, this addition transforms the conception of practical freedom into that of ethical freedom; this last, as the narrower conception, includes the essential characteristic of the first, determination of the will by abstract motives, as an integral part. In speaking of abstract motives, I do not mean that their content exists only in thought; they are called abstract because they originate in mental considerations.

If an animal consciousness is moved by a motive, or stimulated by opposite motives in turn, in both cases the animal's action is completely determined. It follows necessarily the ruling impulse. Knowledge of the relative strength of the impulses is knowledge of the action. A man's action in similar position is not, however, completely determined. It may follow the impulse, or not occur at all, or the action opposite to that suggested by the impulse may happen. The willing and action of a man depends not only on inclination and impulse, but on a wider class of motives, motives that proceed from the ideas of honour, duty, the moral character of an action. By these motives man may withstand impulse and even prevent its appearance. He can act against impulse, and do the opposite to that toward which immediate sense impulse urges him. Even if he cannot always do this, the power of those secondary motives arising from abstract considerations still influences his will. It still opposes his sense-inclinations, as the inner battle of motives against natural instincts proves to him; and after it has given way, it again gains control over consciousness.

Man has a double will: a sense will, the impulses of which are inclinations and passions, and the particular constitution of which is to be regarded as the expression of his inborn nature; and a moral will which governs these natural impulses, opposing them, or even pre-

venting the expression of them. Because one connects with this second will the consciousness of himself as a moral person, the illusion must often arise that his actions are not the full and true expression of his will,—that he really wills the opposite of what he does. Although his will always follows the strongest feeling, the motive at the time most powerful, and must follow this, yet there is still present in consciousness, a wish or desire, the motive with weaker feeling, which is ordinarily the moral motive, the motive of the universal will. In such cases the dualism between one's moral and individual self becomes most clear, and often most painful. Consciousness asserts that he wills, and yet that he does not will what he wills. Man is able not merely to will, but to will or not to will his willing. He may make his primary will the object of his secondary will, to be admitted or denied, approved or rejected. He has this power because the expressions of his will, from the beginnings of life, have been objects of judgment, of willing or not willing by a second will, not foreign to the first, but of the same nature as this. In a certain sense it may be said that man may will opposites at the same time. But he cannot as the same subject. As subject of the universal will, he can will the opposite of what he can and must will as an individual. Nor is it to be overlooked, that what one really wills to do in every single case is the result of the influence on his inclinations and his character which the abstract motive of the moral will has already realised; therefore in a given case the action could only be what it actually was.

Determinism is so far from questioning the influence of abstract motives on man's action, that it finds in these the decisive characteristic and the immediate cause of voluntary action. But this practical freedom, this power to determine action by general motives without

reference to sense impulses, cannot be regarded as unlimited or unconditioned. Determinism recognises that this capacity arises under definite conditions, and expresses itself in accordance with definite law. It considers this freedom as won in social life, as product of the education of the individual will by the will of the community.

Because the processes of external nature are under universal laws, for this reason, and this alone, are we able to rule external nature. We combine causes, the exact effects of which we know, and confidently expect the intended result. The unbroken regularity of natural processes, which we presuppose and invariably find when we study the facts sufficiently, not only makes possible action with a definite end in view, it also produces an effect upon our minds like that of regularity in a man's action whose good purpose, power of will, and intelligence we know. We denote this by the word *trust*. Our trust would disappear in both cases alike, if there could be a reasonable doubt that every event and every action was subject to law.

Unless the will were under law, unless it depended on causes the effect of which was constant and uniform, there could be no inner rule over the will, and therefore no practical freedom for men. Determinism of the will, and this alone, makes possible control and self-control of the will; and this self-control is nothing but our continuation of the control over our will by the will and intelligence of our fellow-men. The very fact of education and development of the will is, as already remarked, a sufficient proof that determinism is true. Not merely would education necessarily fail in dealing with innate characteristics, perhaps because the art of education is so crude, rather than because the inborn nature is so stubborn; in fact education must always prove fruitless, and would certainly be an

unknown thing, if the will were really dependent on nothing but itself. Absolute freedom of choice, power of self-determination without cause or reason, could always annihilate the power of the wisest and most lasting training. What good fortune that the good man must execute good actions, that there are conditions under which the good is necessary, causes which must limit and restrain the bad. This would all be impossible if it were left to man's caprice either to act or not to act, *i.e.*, even when all causes of his action were already fully determined. By showing that man's practical freedom is conditioned, determinism proclaims a theory which is of the highest practical moment. We ought to study the conditions controlling our freedom in order to attain that freedom. We are not to change man's nature, but the circumstances under which this very nature expresses itself.

He who controls the causes of the will controls the will itself; to change the combination of these causes is to change their effect, the expression of will. The causes of the will are partly of a physiological, partly of a moral nature. They include both causes in the narrower sense, and also self-conscious motives. To control and regulate the former is the aim of man's physical education; to awaken and strengthen the latter, the vocation of his moral training. The energy of our will, the vigour and persistency with which we act, is due more to health and physical habit than to the moral advice we receive. The direction of our will, on the other hand, the division of its energy so to speak, depends rather on the training of our mind, and is directed by moral convictions. Practical freedom is no innate possession of mind. It is an acquired faculty, originating when the will is made free from the power of immediate motives, of passions and inclinations, and is made subject to mediate motives.

This freedom, which for moral reasons is peculiar to man, has nothing to do with that "transcendental" or "cosmological" freedom which Kant defined as the power to initiate an action "by one's self," that is, without cause or reason. It is very strange that Kant failed to see that the conception of freedom in his "Critique of Practical Reason" is different from, indeed opposite to, the conception of it in the "Critique of Pure Reason." The freedom which Kant bases on the moral law, as a practical postulate, is the causality of reason, the dependence of will on reason. Transcendental freedom, on the other hand, the power to begin a state one's self without being determined by a cause, must be (so far as the will is concerned) independence of this will from all causality. A reason determining the will is a cause of the will. The will cannot be determinable by reason, and at the same time free in the "strictest" (at the same time the emptiest), the transcendental meaning of the word. If the idea of the lawgiving form in maxims of action is to determine it as Kant teaches, the determining reason is outside the will in a certain form of action, namely, the form of its object. The will does not determine itself, nor initiate action itself, without cause,—even granted that will and reason may be regarded as one and the same. But in Kant's view the two must be distinguished, reason as the faculty of form that prescribes law to action, will as the power to act,—the one legislative, the other executive. A will determinable by reason is necessarily a will dependent on reason. Practical freedom of the will excludes transcendental freedom, the latter necessarily makes the former impossible. Both conceptions of freedom cannot apply to the will at the same time. A power of freedom uncontrolled by law would coincide in its results with the effects of a blind necessity. Indeterminism and fatalism

have the same practical result, for action appears alike without meaning, whether it be subject to inner chance or to external fate. Practical and moral freedom can only be acquired if conditions exist which make it possible.

§ 13. Man is not born a moral being. He can become one, unless insuperable natural characteristics prevent the acquisition of moral freedom. Such exceptional cases aside, we may show how the individual owes his moral freedom to life in the community.

If a man were left wholly to himself, and remained without any influence of social environment on his feeling and will, his actions (like an animal's) must follow the play of inclinations and passions. The imperative of expediency would in time arise, not, however, the imperative of duty. Experience would sharpen his faculties; his intelligence would teach him to use the best means to satisfy his desires, and to sacrifice momentary pleasure to a greater and more enduring one in the future. But on this supposition his consciousness could never reveal to him that he *ought* to withstand certain impulses and to refrain from certain actions, that his doings and refrainings stood under any other law than that of expediency and his own interest. The external world, the laws of which govern the result of his action, can no more impose duty on him than can his own mind in its isolation. Nothing would say to him, sympathy is better and nobler than love of self. From the standpoint of nature, no one feeling is to be preferred to another. But man cannot isolate his psychical being from that of his fellow-men; even when alone he is not wholly left to himself. His will is continuously under the will of the community of which he is a member. He is wholly unable to escape the constant influence of family and companions in trade, state, and nation, even if he attempts to leave family and nation, and give up his trade. In fact, he

can only sever his connection with one circle of men by joining another. Even the anchorite is not alone. He lives psychically in a union, conceived in his mind but none the less real, with an ideal society (of his God, of his saints) which must be formed after the type of real society. Not only man's actions, his thoughts and wishes too are under the control of a universal, impersonal will in him. He must compare this constantly with the biddings of his own will, and the result of this comparison is expressed in the words, *thou oughtest, thou oughtest not*. The universal will has become a part of his self-consciousness, because his self-consciousness has been developed under the direction of a universal will.

No creature is more dependent on his fellows than man on his fellow-men. None is born more helpless, equipped with fewer faculties, and at the same time with a greater wealth of faculties to be realised, none so undeveloped and so capable of development as man. This is the reason why his development goes so much farther. The longer duration of childhood means a longer and closer family relationship; the greater difference between childhood and ripe age, a more complete organisation of the family. Again, in man the connection of the individual with the community is rooted in the natural impulses of social life. Want and necessity compel him to associate with his like. But the human race is distinguished from other animal species, in that it does not continue to be limited to these natural impulses and their immediate reality. Because the common life of men affects the individual far more, and enters into his life far more deeply than in the case of any other animal, the individual is far more clearly conscious of his connection with the whole. Social man progresses from the communication of his emotions by gesture to the communication of his ideas; in speech he

creates a half natural, half artificial instrument of common thought, according to the laws of which he regulates his own thought; an instrument, also, of the social will, which he expresses in command and forbidding, in praise and blame, and to which he subordinates his individual will. It is a fact of decisive importance that to man not only the external nature of things, with their actual power, but also the inner nature of his fellow-men, appears as an authority; that not only is his action limited by the circumstances and relations of the outer world, but his will also is limited by the laws of the community. Because his own will measures itself by, as it were mirrors itself in, the will of the community, man by reflecting on the motives of his action gains the power to judge his primary will by a secondary one, and to subordinate the motives of the former to the reasons controlling the latter. I repeat, only by the education of his individual will by the will of the community, with which natural bonds of sympathy and love unite him, and toward which he feels piety and respect, only thus does man acquire control over his will, *i.e.*, practical freedom. Man's will is formed by the will of his fellows, the individual will, by the will of the community.

Only where will stands opposite will, can one speak of real duty. *Thou oughtest* means *I will*; the ought needs always a *will* to complement it. The only question is, Who is the ego which utters that command, "*I will*"? Is it my individual ego? If it is my individual ego, if the will I express is my personal will, determined by my own interests, the command has only the meaning of a dictate of power which can compel a second will, but not lay duty on it. If, on the other hand, it is the collective ego, I speak to others as to myself in the name of the collective will of the community, the imperative becomes a moral law, binding me and others from within. Universality is, in fact, as Kant teaches,

the form of the moral law. The moral law is valid without respect of persons and their individual inclinations. But this is only its form, the content which is expressed in this form is a universal interest of the will, a universal good for man, which serves to support or increase man's psychical life. He who subjects his action to universally valid laws, always observes the form of morality; he who also makes an interest of the universal will the interest of his own will, acts morally with reference to content also, but only for his own time, and from the moral conviction of his environment. The content of moral actions is constantly changing and progressing because the life of the moral spirit progresses; but the form of duty remains constant, and must remain so, because it is the cause of the moral will. Duty is the condition of practical freedom, because it is the cause of the moral as distinguished from the natural will. When duty does not go before, there follows no freedom, no freeing of the individual will from immediate sense impulses, by the subjection of it to the reasonable motives of the universal will.

§ 14. The completeness of every compound psychic activity, as of any other organic activity, depends on the degree of differentiation in the functions which unite to produce the activity. So the starting-point in the development of the will is the clear separation between the emotional and the intellectual factors of consciousness, which unite to form the act of will. Where the act simply follows impulse, where there is not the least choice between completing or omitting it (such choice being based on the idea of its results, and the comparison of these with the general aim of consciousness), we cannot speak of a real, a proper act of will. The fact that the expression of impulse by consciousness is accompanied or even stimulated by an idea is not enough to make it an act of will. It only becomes such when

consciousness reacts on the expression of impulse. This distinction is characteristic enough to justify the distinction between an act of impulse and of will. It is as great as the distinction between association and apperception; it is in fact coincident with this. The same checking and regulating effect which self-consciousness exercises on representative ideas, their course and their grouping, it exercises in the action of the will on impulses. So the first element of every act of will consists in holding back the immediate expression of impulse. Between the impulse and its expression there is introduced a process of thought which gives rise to secondary feelings that sometimes acquire supremacy over the primary. The act is omitted when the feelings roused by definite thought oppose direct impulses; it is permitted, *i.e.*, the check is transformed into a reinforcement, if primary and secondary feelings coincide. The more space and influence this process of thought acquires, the more this act assumes the character of a true act of will. To act in accordance with impulse is not to will; to will means to act with reflection, whether this be with or against impulse. The height of intelligence and the degree of its influence on action are the measure of the will-development attained.

The separation of the emotional and the intellectual factors of the will, evidently becomes greatest when the two factors are divided between two different subjects, which, however, continue in psychic connection, so that the will of the first is directed by the intellect of the second. This actually happens in social life. Father and son, teacher and scholar are such pairs of psychically connected subjects, so connected in order that the will of the dependent member may be more highly developed. That which for the one subject is motive of the will, namely a feeling or an emotion, remains for the other a mere thought, not affecting his will. This latter

with his intellectual freedom may gain an influence over the motives of the former, and regulate even his will by regulating his motives. So the father or the teacher meets the motives affecting the child's will by counter motives, or else he removes their causes. He gets control of his child's emotions, by checking their expression or preventing their appearance. Certainly character is not formed and transformed by mere advice and reasonable suggestions. But by changing the environment of one's action, by thoughtfully arranging the motives of his will, he can be made to transform himself, just because his will obeys motives and is dependent on causes. But there is always need of a second subject, who is not himself influenced by the motives of the first, whose consciousness these motives do not affect with the same immediate power. It is only possible to reach practical freedom in social life. Man becomes a being morally free only with the aid of his fellow-men, only thus is his will freed from the compulsion of sense impulse, and made susceptible to the influence of moral motives. The will of the inexperienced man is trained by the wise will of him who has experience; a new will is created by practice and habit in the mind of the growing individual, and this new will, this second ego as it were including the first, gains constantly more control over the natural will. By encouragement, which the teacher gives the child, he awakens in his mind the idea of his own power. He knows that a "will" comes from the experience of a "can," that trust in one's own power is a most effective cause of action. While continuously he refutes the metaphysical freedom of the will, he himself assists the youth to gain psychological freedom, the power to act from conscious motives. And man's capacity to wish that he had willed the opposite of what he does will and must will in a given position, he will not disdain as a stubbornness of innate dis-

position, but he will regard it as an important means in the art of education. A wish, which is in a general way attainable, is an act of will begun, and often it is only necessary to strengthen it to make the act of will complete. Finally he will turn the child's mental glance toward actions to be done, rather than toward the past; instead of giving him over to idle regret and unfruitful remorse, he will stir up courage for better action in the future. To say to one's self, I might have done otherwise, is foolish and certainly false; to say, I will act otherwise, is an assertion that can be made true, and the wish to make it true is a partial cause of its realisation.

§ 15. With reference to this theory of the origin of practical freedom, it will be asserted that education can change man's action, not his will. The individual's character, his natural constitution is unchangeable, therefore education can only be a transformation of the mind, which does not reach down to the roots of disposition, but is concerned with the surface of behaviour. This means essentially that there is no education, but only training in manners. For the Idea of education includes a transformation of character itself, and stands in contrast with the training which influences only the form of external behaviour. This view is practically the one defended by Schopenhauer. It is entirely justified as a reaction against the exaggerated expectations of what education would do, entertained by the *Aufklärung*, and in particular by Helvetius. Education, it was held, would immediately work miracles, and could make out of any individual just what it wanted. Though this view contradicts the facts far more harshly than Schopenhauer's, this latter also is at variance with experience when it denies to education any influence on man's character. Man's action cannot be changed without at once affecting his character (though it be only

mediately). Beyond a question innate temperament is the essential factor in the formation of will, and certainly character is individual, as Schopenhauer teaches. Nor does character show any such individual differences in other species of living beings as in men. Undoubtedly also it is empirical, *i.e.*, we learn our own natural constitution only by experience, and (I want to repeat) never even thus completely, because we cannot be put in all possible circumstances of action. But it cannot be absolutely unchangeable, for the very reason that it is composite. Schopenhauer's conclusion that character is not subject to any change, is only necessary on the supposition that character forms an absolute unity because it is the outcome of a simple transcendent act of will, so that in every case, in every individual, it can have but one fundamental direction. It may be mentioned here incidentally that this belief of Schopenhauer's proceeds directly from Kant's theory of an *intelligible* character, but, as a strange element, it introduces contradiction into his own monism of will. Experience does not confirm Schopenhauer's metaphysical hypothesis, nor his conclusions. It teaches that man's natural character is composed of various qualities and fundamental lines of effort, and is changeable (though only within certain limits). In the first place every one's character changes with age. At least I should not know what was meant by character, unless this peculiar and regular change of the whole man does pertain to his character. Can a boy before the period of puberty, which so deeply affects his emotional life, really have the same character as the youth? Can an old man's character be just like that of a man in the prime of life? Granted that this change affects one's race character rather than his individual character, certainly this last does not remain intact. A real separation between the two is impossible. In some cases

the individual character primarily is affected by the change. Who is ignorant that a man's temperament often undergoes a more or less complete transformation as the result of severe experiences? Nor should the pathological changes of character go unmentioned, for these evidently contradict its assumed simplicity and unchangeableness.

Schopenhauer himself recognises a change of character which he calls "negation of the will to live," and for which he finds confirmation in the literature of asceticism and mysticism. Whether the phenomenon in question be included in the class of pathological changes or not makes no difference; it cannot be harmonised with the assertion that the nature of the individual man is unchangeable. Schopenhauer, indeed, regards it not as a change, but as an annulling of the individual character; the saint, however, who experiences this inner transformation does not immediately fall to the ground dead, he lives on as an individual man, and so he must have assumed another individual nature.

The question as to the formation of character is no longer discussed on the same plane, since Darwin gave a scientific basis to the theory of descent and development in organic nature. The form in which it was put even by Kant and Schopenhauer, the only form in harmony with the science of that time, is antiquated to-day. We distinguish qualities which have been developed and fixed by the history of the race, and such as were first reached in the individual life. This distinction coincides roughly with the distinction of innate and acquired qualities. The former are relatively permanent,—they are only changed by the process by which they were developed and fixed,—the latter we regard as subject to change. Not all innate qualities are developed by selection (natural selection leaves room for certain innate qualities which have no

meaning in the struggle for existence), but all qualities developed by selection are innate. The natural constitution of a man is composed of innate race characteristics, and of innate and acquired individual qualities, which last include pre-eminently man's mental faculties, that originate, as we have seen, in social life. Only the innate and acquired individual qualities are subject to change by education, and the former of these only by the aid of the latter. It is evident that the acquired faculties must have some influence on the innate, for in the psychical life every effect is reciprocal even more truly than in the purely organic life. By different distribution of the innate elements of individual character, by increase of one faculty with practice and lessening of another with neglect, a new psychical equilibrium is brought about, a new character is formed in which acquired and innate qualities are closely united. Wise education will follow in general the way marked out for it by the physiological development of the individual. It will not ask boys to look at things as a youth does, nor will it ask of the youth a man's work.

Still it cannot be denied that the moulding of the innate individual character must always be incomplete and limited. While the innate faculties are rooted deep in the organisation, because they in all probability depend on the constitution of the germ-plasm, and so are transmitted from generation to generation in the unbroken sequence of germ-cells, the acquired faculties have first to take root. The best education will fail, if it finds bad tendencies in the character, weakness of will, stubbornness of disposition, perverse inclinations. Yet man's practical reason may escape even from this apparently insoluble difficulty in the way indicated by Plato. The thought which Plato developed in his theory of the state, and to which I refer here, will sometime, I am sure, be realised, just because it is so important and so

true. When the human intellect has penetrated far enough into the natural law of the *Composition of character*, the will of man can no longer refuse to deduce the genesis of character from the view thus gained. Man will look back with shame on the art and the care which for ages he has applied to make his domestic animals better, but has refused to use in making his own species more noble. He will recognise that it is of far less importance to make men good, than to create good men. The art of character-creation which proceeds from this principle will be related to the present art of education, as hygiene, which would prevent sickness, is related to therapeutics, which aims to heal actual sickness.

§ 16. As an acquired faculty of man, ethical freedom can never be absolute and unlimited. Its effect, in every single case, is compounded with the effect of other causes affecting the will, and these must be of a definite quantity in each case. To assume with Kant that the reason or the moral will is a cause which not only ought to have, but could have determined man's attitude without reference to all empirical conditions, to assume that man is able to withstand a sense-impulse no matter how strong with motives of reason, is really nothing but belief in magic. The moral will may prevent a passion from arising and check an impulse as it appears, but it cannot control with sovereign caprice the impulse which has been awakened and has become a passion. The explosion can no longer be stopped after the fuse is lighted, but it is not necessary to light the fuse. The causality of reason is under laws, or else it is no true causality. Under certain conditions its result is realised as necessarily as in other definite cases it is not. Kant confuses this condition for judging an action, with the condition of an action itself. I must judge every human action according to the reasonable motives of the universal will in order to get at its moral quality, for this quality is conditioned

by its agreement or non-agreement with the course of action which those motives indicate. It does not yet follow from this, however, that such motives have been at work in a particular case, still less that they have been the complete cause of an action. The reason, the moral consciousness, does indeed say to us that an action *ought* to have been different, we judge it from the standpoint of a subject not affected by our sense desires; it does not say to us that it *could* have been different. The understanding teaches us the contrary, namely, that the action under given circumstances and in view of the fact that the influence of conscious moral motives has already had its effect, could not have been otherwise than in fact it was. Even Kant is often conscious of the true state of the case. He writes (though it is in a note):¹ "The true morality of actions, even the morality of our own conduct, remains completely hidden from us. Our responsibility for wrong can only relate to the empirical character. But no one can tell how much is the direct result of freedom, and how much is to be ascribed to mere nature, to some fault or some fortunate constitution of the temperament, which is not due to the individual's choice." Here Kant expressly admits that the power of freedom in any single case is a limited quantity, he brings the causality of reason into competition with the other causes of men's actions, and does not regard it as a cause "in itself complete"—although this does indeed contradict an expression that soon follows.²

Ethical freedom, the influence of moral motives on

¹ *Kritik d. reinen Vernunft*, p. 432.

² *Ibid.*, p. 435. "It is evident that the causality of reason is not merely some such thing as a competing cause, but is in itself complete, even when the sense impulses do not favour it but appear against it . . . so the reason is in fact fully free without reference to any empirical conditions. Reason is indeed free in judging actions afterwards, but the will is not perfectly free in action itself."

the will, is a limited and variable quantity, not only in each particular action of a man; it differs also with different men inasmuch as man's natural constitution is never the same in different individuals. This freedom is not only limited, it is proportional to the prevailing impulses or passions of our natural character. That which scarcely affects one man's will, may influence another's consciousness with irresistible power, and practically destroy his freedom. So the judgment of men's actions must be individualised from two stand-points. The particular circumstances of each action taken by itself must be considered, and at the same time the relative practical freedom of the particular acting subject must not be forgotten. It is necessary to know, or rather to have known, over what impulses a man's practical freedom really extends, before the moral worth of this man's actions can be determined correctly. So it is no easy matter to judge righteously.

§ 17. If man's reasonable will is regarded, not as an innate possession of his mind, but as an acquired faculty; if this faculty comes, not from a "transcendental" freedom, but from the determination of individual will by the will of all, then Kant's most penetrating theory of the *intelligible character* receives a remarkable confirmation. In the form Kant gave this theory, it lacked inner unity and logical consistency. The conception of the intelligible character serves a twofold purpose, and this destroys its unity. On the one hand it is to explain the remarkable differences in the empirical character of men, on the other hand it should establish man's character as a being controlled by reason. In its more general meaning, the intelligible character is the character of a "thing-in-itself," and as such it comes from freedom in the "cosmological intellect," from transcendental freedom. In its particular meaning as applied to man, it is

the character of a reasonable being which originates in practical freedom, in causality of the reason. When Kant connects these two meanings of the conception, and considers man's character as a "thing-in-itself," the same thing as his character as a reasonable being, he deduces the intelligible character from both transcendental and practical freedom at the same time. In this way practical freedom experiences an unjustifiable limitation fully inexplicable on Kant's principles; it is no longer the causality of reason in general, but a certain causality of reason.¹ The intelligible character explains at the same time the fact that man is a reasonable being, and the fact that the individual man is this particular reasonable being, having a particular empirical character. It is easy to see that in this way empirical determinations are taken up into the intelligible character, that an external chance is added to reason and its causality, such as corresponds to the deduction of this from practical and transcendental freedom at the same time. If, however, as Kant assumes, man's transcendental freedom should really mean the same as his practical freedom, then the character which man creates for himself by his freedom ought to be one and the same, in the case of all men. The causality of pure reason (in which freedom is said to consist) can create none but an absolutely reasonable character. Accordingly there is but one intelligible character of man, and this cannot be man's individual character, the character by which individuals are distinguished; it must be the universal human character, that in which all men agree. Kant's individualistic standpoint, which appears also in his ethics, blinded his eyes to the consequences of his own premises. He seeks the origin of the moral will in the individual

¹ *Kritik d. reinen Vernunft*, p. 433; *Kritik d. prakt. Vernunft*, p. 229.

intellect, he connects reality of this will with the individual mind, and makes the development of the universal moral spirit coincide with the development and the fate of the individual man; because he has practical reasons for belief in the substantial soul, the existence of which, as he had shown, could not be proved theoretically.

As the moral consciousness can only be understood from the standpoint of social life, to which it owes its origin, so the conception of the intelligible character can only be understood, its reality can only be recognised, when it is related not to the individual but to the race. The intelligible character is the moral character of the race, in distinction from the individual character. It is the character of mankind in the man. This character, which originated and constantly originates anew in social life, is itself developing and receiving more completely the form which corresponds to the increasing solidarity of the race. In the history of man it finds its realisation; it can be regarded as perfect only in its Idea. The moral life of the individual does not come from it, but strives toward it. Instead of *beginning* with man's intelligible character, as did Kant, one ought to *end* with it. It has been regarded as the ideal goal of the individual's moral perfection; it consists in this, that a man represent in his person the pure character of mankind.

A community of men, be it family, state, or nation, is something more than, and something different from the number of men who belong to it. From the physical interaction of its members thus united, there proceeds a mental life which transforms the qualities of each individual member, and subordinates these to its own ends. In this sense we speak of the spirit of a family, the spirit of a nation—and in this sense we shall speak of the spirit of mankind. And yet the Idea of

the universal human spirit, the moral character of the human race, is already present and active in our consciousness.

If a member of a community closely bound together separates himself from the life of this, he takes with it a portion of the real inner life of all the other members. His moral individuality, which now has been broken up, had reached beyond the limits of his physical individuality. His mental life was not individual, it was a life with and through the community.

This solidarity of the individual life with the community must be grasped before one can understand the moral consciousness with its obligation, its responsibility, its sacrifice to what is general, but none the less real. Nature has made man social, social life makes him moral. Man is not born as a free reasoning being, he is formed into such a being, and the origin of his practical freedom is the determination of his individual will by the will of the community.

CHAPTER IV.

THE COSMOLOGICAL PROBLEM OF THE INFINITE.

§ 1. BY reason of the very unity which is essential to consciousness, we unite all objects of knowledge under one single conception of reality, and call this the World, or Nature. In doing so, however, we do not treat this conception as a product of the connecting activity of our thoughts, but as a basis which already exists for the relations we establish, and to which these relations should conform more and more closely. Inasmuch as every connection between our thoughts presupposes the unity of consciousness that makes this connection possible, so we presuppose a unity of the world, a totality of the real, as the actual basis for the relations of objects. All that is, and all that happens, exists and happens within the same whole, and under the same law. As every modification of our consciousness belongs *d priori* to one and the same ego, so every thing and every change belongs *d priori* to one and the same world. There is a complete analogy between Thought in its all-embracing form, and the World in its all-embracing reality. The unity of the World corresponds to the unity of consciousness.

Let us name this concept of the world which necessarily arises from the unity of thought the logical concept, and distinguish it from the concept of the world due to sense and to experience. There is but one space and one time; therefore all real and all possible per-

ceptions of things are comprehended in one common whole which we call the *sense-world*. Nor is this unity and uniqueness of the world a matter simply of time and space, or of logic; it rests also on empirical foundations, it follows from the homogeneity of matter and the persistence of energy. Matter homogeneous and of fixed quantity, indestructible force which existing in the *cause* persists in the *effect*; these ultimate foundations of external being and change form the empirical concept of the world. They connect the present of nature with its past and future.

World and Nature as names for the real have not quite the same meaning. The former denotes the totality of things as existing and developing in one universal form, the latter refers to the whole as having a certain mode of activity, and as developing according to law. World and Nature may be distinguished as Kant's mathematical whole and dynamical whole. In accordance with this distinction, the cosmological problem has more definite reference to the question whether or not the world is finite, and whether matter is continuous or discontinuous in space. Nature furnishes the picture for this frame, the actual content for the mathematical form. From this cosmological problem we shall distinguish the *physiological*, if we may use this word in its original and more general meaning. The critical theory of nature requires a correct understanding of order and law, or in a word, a knowledge of the *systematic* of phenomena; the remains of an anthropomorphic subjective explanation of nature must be removed without giving up the unity of nature. This problem is to be discussed in the next chapter, after we have treated the cosmological question.

A concept necessarily formed cannot be self-contradictory; for this would mean that the contradiction had its origin in the pure understanding. It can only appear

contradictory when it is united with concepts that are incompatible with it.

If, as Kant teaches, the concept of the world is the source of antinomies because assertions which he treats as antithetic can be proved with equally clear, distinct and incontrovertible arguments, still we cannot infer that the concept itself includes a contradiction. The concept of the world cannot be treated as a concept voluntarily invented and involving in itself contradictions (as for example the concept of a square circle), nor can it be set aside with a remark that no content can be thought by it. If then there were antinomies, not in the concept of the world, but with reference to this concept, this "remarkable phenomenon of pure reason" could at most prove that pure thought can by itself reach no answer to the question proposed. Equally strong proofs for opposite assertions would annul each other, and not the concept of the world; thought would be in a state of complete indecision. Where both sides of the contradiction are proved, nothing is proved.

Since Wundt's careful study of the matter, there can no longer be any doubt that at least Kant's "dynamical" antinomies are not real antinomies.¹ The proofs of the theses, namely the assertion of a causality by freedom, and of an absolutely necessary being, are conducted by means of ontological arguments, while the proofs of the antitheses rest on universal principles of experience. But opposite assertions, based on entirely different pre-suppositions, do not contradict each other. It is hardly necessary to add that the assumption of a causality by freedom and the really identical assumption of an absolutely necessary being as part or as cause of the world, directly contradict the principle of causality. In

¹ Wundt, *Philosophische Studien*, ii. Bd. 4 Heft, S. 495 ff.: *Kant's kosmologische Antinomien und das Problem der Unendlichkeit*.

order to understand the proof of the theses of these dynamical antinomies, it is necessary first to forget the doctrines established by Kant in the *Transcendental Analytic*. This evident contradiction in Kant's system can only be explained by assuming that the antinomies are the oldest part of the *Critique*, or rather that they preceded it.¹ Kant himself gave up the dynamical antinomies as such, when he attempted to prove that both sides were right. Nor can proof of the *mathematical* antinomies with reference to the world as a whole be regarded as satisfactory. The proofs for and against the infinite divisibility of matter are not conducted from the same or similar standpoints. The reasons offered on either side are not homogeneous, so that there can be no real contradiction between them. The thesis is proved ontologically from the conception of a composite reality, while the antithesis is proved for perception from the idea of space. Both proofs may be valid even for the same thing; but they do not apply to it in the same respect, so there is no contradiction. There would remain then only the antinomy between the assumption that the world is limited in time and space, and the assumption that it is unlimited; and in fact this question does seem most like an antinomy. It is unnecessary to lay much weight on the inconsistency of Kant's proof, the fact that the argument for finiteness of space and time uses only the concept of time, while the argument for infinity uses also the intuition of space; apart from formal objections, it can be shown that Kant's proofs form no absolute antithesis. The proof of the antithesis might even be valid for the

¹ This fact, conjectured by Erdmann and by myself, has since been confirmed by original testimony. Cf. A. Stein, *Ueber die Beziehungen Ch. Garves zu Kant* (Leipzig, 1884, pp. 44-45) Kant's letter to Garves. "It was not investigation as to the existence of God, but the antinomies of pure reason which first awakened me from a dogmatic slumber, and impelled me to a critique of reason itself." Cf. *Prolegomena*, § 50, beginning; p. 108.

ideas of space and time, and at the same time the thesis might hold good of things represented in thought. The fact that the things which are represented in time and space are themselves only ideas, is a presupposition not considered by thesis or antithesis. Rather both are based on the dogmatic conception of the sense-world as a whole existing by itself. If they had been based on the critical conception of the world, there would have been no antinomy; neither limit nor absence of limit could be proved of the world as it exists in itself, and apart from its appearance for sense knowledge. We must forget what was taught in the positive part of the *Critique*, in order to give a moment's attention to the dialectic negative considerations that follow.

An examination of the proof of the first antinomy belongs to our investigation, and cannot be neglected. The proof of both theses is indirect. It is impossible to think that an infinite series of successive states has elapsed in the world, so the inference is drawn that the world must have had a beginning. An infinite number of things cannot be thought as having been counted in a finite time, therefore the world must be limited in space. On the other hand it is impossible to think of empty time as existing, therefore the world had no beginning; the world cannot be thought as limited by empty space, therefore, the inference is drawn, it is unlimited in space.

A completed infinity of processes or things that may be *counted*, is undoubtedly a contradiction, not merely of words, but of concepts. It would seem then that the thesis must be correct when it asserts a beginning in time, and a limit to the world in space. But is it necessary that things and processes be thought as subject to enumeration? Are they given necessarily in such wise as to be determined by number? This is of course true of things separated in space. So far as things are

separated in space, or seem to be, they must be subject to Dühring's law of the determination of every number already posited.¹ This is essentially the same as Kant's argument, used in defending his thesis against the assumption of an infinite number of coexisting things. It is equally certain, however, that this presupposition does not hold good of processes in time. These are not in themselves numerically determined; rather, they only come to be thus determined by distinctions which we make in thought by relating them to things in space, and by enclosing them in spatial limits. I may count it one revolution whenever a planet passes some definite point in its orbit, but I should not forget that this point does not mean any real division of the planet's motion. The planet does not stop a moment here; it passes this as it passes any other point I may select. All the revolutions since it began to move about the sun form really a single process, which follows immediately without any break a previous process, the separation of the planetary ring from the central body, and this process in turn immediately follows another, and so on. An argument which depends on number cannot be directly applied to time, for in time, considered by itself (apart from space), there exist no independent self-limiting processes, no processes to be counted. I can distinguish processes in time only in definite, finite, number; no process in time is to be distinguished as independent from those which immediately follow and precede.

If I make the presupposition that time, real time filled with processes, world time, as I may call it, is without beginning, is it not necessary to think of an infinity as completed at the present moment? My answer is a question: In *what* present am I to think

¹ Dühring, *Logik und Wissenschaftstheorie* (1848), p. 191. *Cursus der Philosophie* (1875), p. 64 sqq. *Neue Grundmittel und Erfindungen zur Analysis*, u. s. w. (1884), p. 63: "Everything posited as actually given in terms of number, can only exist in definite quantity."

the infinity of time as completed? I cannot say that the time which had no beginning has come to a conclusion at any point, *e.g.*, now. It is running on; it passes this point and any other point I may fix in thought, but it is not run out nor completed at any point, for the point has in itself no existence. So Kant's argument against world time that has no beginning, falls to the ground. The argument only has force if it is necessary to think of time as coming to an end some time in the future. In this case alone would the infinity of time really be thought as completed. Absence of beginning and absence of end of time each demands the other. If time can end it must have begun. But every beginning is in time; an absolute beginning, the beginning of time, is unthinkable and self-contradictory. In the same way every end is an end in time, not the end of time, because any process gains independence and a goal, only as it is related to space, and not to time alone. Kant is wrong in regarding as indifferent "our attitude toward future time, whether we conceive it as sometime ceasing, or as running on for ever." Rather, an unlimited regressus in time is only possible on the supposition that its progress is unlimited. The possibility of thinking future time as going on indefinitely, alone makes it possible to think time as unlimited in the past, or without beginning.

In the same way, Kant's argument against the assumption that the world is infinite in space, cannot be regarded as valid. The argument, *viz.*, that an infinite time must elapse in order to count infinitely many coexistent things, holds good only on the assumption that number is immediately applicable to the real itself in space, and the farther assumption that the spatial universe must have come into being by the continued addition of part to part, just as our knowledge of it progressively synthesises its parts and therefore is never com-

pleted. If we think space as filled with continuous matter—and no *à priori* reason forbids this—the argument loses its force because it proves too much, it proves that space itself is limited. Assuming that space is filled continuously, what applies to space must apply to that which is in space. It is beyond question that space itself did not originate by the synthesis of separate parts; and the proof of this is that space cannot be separated by analysis into final simple elements. We say it is infinitely divisible, which means that it is not compound, and therefore did not originate by a process of composition. It is impossible to represent fully an infinite space filled with matter by constant synthesis of its parts, so that it is impossible to infer that the real in space must be limited. The grounds that would compel this inference, would also establish the limitation of space. Kant has not proved his thesis.

The argument for the antithesis, that the world is infinite in time and space, falls into two parts. These should be considered separately, for the method of proof is different, and of different value in each case. The proof of infinity in time is incomplete; the proof of infinity in space is not universally valid.

If it is assumed that the beginning of the world means non-existence of the world before this beginning, and that it presupposes an absolutely empty time in which nothing at all existed, no objection can be made to Kant's proof that an origin of the world in time is inconceivable. Nothing can originate or be conceived as originating in a time in which nothing exists. In such a time, as Kant remarks, no part involves a decisive condition of being rather than non-being. But Kant has not shown that this assumption is necessary. If the beginning of the world means only the beginning of the interplay of changes, as Dühring thinks, time need not be regarded as entirely empty before this

beginning. In this view, time does not lack content to fill it. Kant makes the opponent, whom he would overthrow, assert more than he needs to; so he does not overthrow him. The assertion that the world began does not necessarily involve the assumption of time that is absolutely empty and yet real, so that it cannot be set aside by simply showing the impossibility of this assumption. It could not be disproved at all if there were no other argument against it. Kant's proof that the world is not limited in space has far greater semblance of validity. A relation of the world to empty space, Kant argues, would be a relation to something that does not exist; such a relation, the limitation of the world by empty space, is non-existent, therefore the world is not at all limited in space. This proof holds good, however, only on the supposition that space, as we think it, really exists in itself, *i.e.*, outside our idea of it. This supposition is false, as we have learned from the Transcendental *Æsthetic*, so Kant's proof, judged by the results of his own teaching, has only the appearance of validity. If space is a phenomenon of the world for external sense, if as an idea of the form of intuition it is nothing but an idea, there remains no valid reason for inferring the nature of the thing represented, from the character of the idea representing it. Space may be unlimited, and the world perceived in space may at the same time be limited. We *can* no longer say that the world is limited by a void; we shall rather say that the empty idea of space, the mere schema for our thought of things is limited by the world. (This too is only valid when we treat space not as pure intuition and wholly independent of the intuitions of external sense, but as empirical intuition, bound up with these sensations.) Limits exist in space only so far as they are set up in space, real limits exist only so far as real things, being felt and perceived, set up such limits.

The infinity of space is not a quantity of space, but rather the possibility that quantities may be determined with reference to space; neither the finiteness nor the infinity of the world follows from this. Thus the only argument which might lead us to assert *à priori* the infinity of the world in space, is set aside by the critical theory of space. The void which must surround the world if we are to think it as limited, is itself only an idea, and no actual limit of things. It is but the form in which we represent to our imagination the totality of actual things as limited or measured. Empty space outside the world, or in the world, is but a schema of representative thought by which we think limits, and distinguish elements. This schema has its reality in the subject, not in the world outside this subject.—In his remarks on the proof of the antithesis, Kant himself suggests the possibility of thinking the world as limited, without the necessity of assuming an absolute extended space outside the real world; but he attempts to answer this objection by the remark that his proof does not apply to the world in general, but only to the sense world, which disappears when space, the condition of its existence, is left out. If the proof of the antithesis is valid only under this limitation, it cannot be set over against the thesis, which knows no such limitation. There would then be no antinomy, which indeed is just what we are attempting to show is the case. Undoubtedly the laws of external intuition, the formal constitution of external sense can only apply to the phenomenon of the world, and not to the real which appears. This limitation, however, does not affect the question whether the real is to be thought as the basis of a limited or an unlimited phenomenal world. If we abstract from the conditions of the perception of the world, we do not have left, as Kant thought, merely the indefinite concept of a world in general; but rather the definite

concept of the cause of given relations and actual differences of phenomena, for these relations and these differences cannot be derived from the forms of intuition alone.

Instead of proving both thesis and antithesis, Kant proved neither. The problem of the finiteness or infinity of the world as a whole may be transcendent; but our understanding is not given over to a transcendental illusion as to this question, nor is it involved in self-contradiction.

§ 2. The critical decision, with which Kant closes the "cosmological strife of reason with itself," is not dependent on the correctness of the proof of the antinomies; it depends merely on the results of the "Transcendental *Æsthetic*." It is valid so far as these results are correct and established, nor was there any need to take a circuitous course through the antinomies in order to prove it. The dogmatic view of the sense world as a self-existent whole is an assumption which precedes the critique of sense knowledge, and in fact it was the stimulus to this critique in Kant's own experience. Still it was wholly unnecessary to bring it forward again, and involve it in illusive proofs, after the critical standpoint was once established. In discussing the critical part of Kant's doctrine of the antinomies, we shall limit ourselves to the solution of the cosmological problem in the narrower sense, the question whether or not the universe is limited in time and space.

The essential and only secure result of the Transcendental *Æsthetic* may be stated as follows:—All sense attributes of things, even Locke's so-called primary attributes, are relative, and so belong to the phenomenal appearance of things. The meaning of this must not be underestimated; it is equivalent to the relativity of all knowledge, and it puts an end both to transcendent metaphysics that deals with pure conceptions, and to

dogmatic natural science which treats its hypotheses as things. Inasmuch as all knowledge must be relative to intuition, and sense intuition is itself relative, it follows that all knowledge whatsoever must be relative, so far as it aims to have a content, and not to be purely formal. We have not accepted, however, the additional statement of the Transcendental *Æsthetic* that the ideas of time and space are pure intuitions.¹ The idea of space is due to two senses alone, touch and vision, and the result is different in the two cases, inasmuch as the modes of sensation for the two senses are not identical. So space cannot be thought independently of the sensations of external sense; in other words, it cannot be pure intuition. The idea of time, on the other hand, is really independent of any particular class of sensations; it applies alike to every class; and for this very reason it is no intuition. Time cannot be perceived; motion, change of position in space is perceived. To represent in imagination the changes of our own consciousness, we must use the idea of motion, *i.e.*, a spatial intuition. The fact that all relations of time may be represented by an external intuition, a straight line extending indefinitely, does not make time itself an intuition. The phrase "inner sense" has been common since Locke, and without doubt this improper expression led Kant to make time the form of the inner sense. This so-called sense has, however, no content except the elements of sense proper, sensations and feelings. There is no special organ for the idea of time like the organs for perceiving space. The organ of hearing is never regarded as the organ of an inner sense, it is only fitted in special degree for measuring time and distinguishing time relations. It is not the organ of the time idea in general. Nor does this idea originate, as Kant teaches,

¹ Vide Riehl, *Die sinnlichen und logischen Grundlagen der Erkenntnis* [*Philosophischer Kriticismus*, II. 1], chap. ii.

in the receptivity of intuition alone, but in the spontaneity of thought as well. It is itself concept and not intuition, an individual concept, not the concept of a class. If one were to speak figuratively of an organ for the perception of time, he must regard the whole consciousness as such an organ. Because time is not thought by a sense nor directly perceived, but known from perceptions, it cannot belong to the phenomenal appearance of things for sense consciousness, as does space. Persistence and change, the two relations of being that are united in the idea of time, apply to things themselves; while the phenomenal appearance of things in space originates in the real or thought relation of the same to external sense. This difference is very important for the cosmological problem.

Inasmuch as the conception of a self-existent sense world (so Kant sums up his decision of the cosmological problem) is self-contradictory, the solution of the problem as to its magnitude must always be false, whether an affirmative or negative answer is attempted.¹ The sense world is phenomenon, and as such it exists only in the thought of a being endowed with sense. It is not given in itself, it is gradually given, and that in the progress of experience from phenomena to phenomena. Now phenomena are real only in perception; apart from perception they are nothing that we can know. "To call a phenomenon a real thing before it is perceived, means either that we must meet with such a phenomenon in the course of our experience, or it means nothing at all."² So real things of the past are only objects for me, in so far as I make them present to my consciousness, i.e., think "that a regressive series of possible perceptions according to empirical laws leads to a completed series in time as condition of present time." "All events from

¹ *Prolegomena*, § 52, c.; *Ros.*, p. 113.

² *Kritik d. reinen Vernunft*, p. 390.

an inconceivable past down to the present mean nothing else than that it is possible to lengthen the chain of experience from present perceptions back to the conditions which determine this in time."¹ If then the sense world originates in the binding together of phenomena, it can be neither greater nor less than the possible regressive series of phenomena.² This series is not distinctly infinite, because infinite greatness as an object of experience, *i.e.*, with reference to the world as an object of sense, is absolutely impossible: nor is it distinctly finite, for no limit of phenomena can be thought as absolute, no beginning in the sense world can be thought as first. The answer in regard to the infinity of the world runs as follows:—"The world has no first beginning in time, no external limit in space." But this answer must be understood as purely negative. It denies that absolute limits can be set for the sense world in space, or in time; and it denies this for the reason that this world is not given as absolute; but it does not assert that the sense world as a whole is unlimited, for in this case the sense world must be thought as self-existent, and this involves contradiction. The sense world has no absolute limit, so runs Kant's result; the empirical regressus, by which alone it is given as conditioned, has its rule, namely, to proceed from each member of a series as conditioned to the member of the series next beyond, *i.e.*, to regard no event reached by inference from experience as the first, no spatial phenomenon coming under our observation as the extreme.³ The phenomenal world is not finite, nor is it infinite; it is indefinite, progress backward and forward in it is without limit. This does not determine the extent of the world; rather, it denies any determination of its extent.

¹ *Kritik d. reinen Vernunft*, p. 391.

² *Ibid.*, p. 408, Anmerk.

³ *Ibid.*, p. 410.

Clear as these results seem when applied to the sense world in general, *i.e.*, to the general mode of representing the world according to the laws of intuition, their inadequacy must appear as soon as we attempt to apply them to the objective basis of sense phenomena. Kant's answer to the cosmological problem dodges the point. We do not care to know how far the possible regressus of our intuitions may go and not conflict with the subjective laws of thought, we ask how far the real progress empirically given extends into the past or the future along the line of actual phenomena. Are we to assume that going from phenomenon to phenomenon we shall always meet with new perceptions, or would there sometime and somewhere be nothing beyond to perceive? This question is not answered by the remark that a perception of nothing is impossible. We cannot of course perceive that we have no perception; but we can certainly experience the fact that we have no farther perceptions, and must infer from this that there no longer exists anything to be perceived. If we could perceive the molecules in a body, we should have before us the final elementary phenomena in space, beyond which there is nothing to be perceived (provided the molecular theory of matter is correct). And why should not the dark starless spaces in the sky afford real glimpses out into a world space not occupied by matter? What we perceive in the phenomenon according to this view, is not indeed the void as such, but (apart from light entering at one side) the self-stimulation of the eye itself, which we feel as darkness. Schopenhauer has remarked that the question as to the extent of the universe in space is not absolutely transcendent, but rather empirical.¹ The possible or even necessary extension of space beyond the limits of the sense world,

¹ *Parerga*, i. (Berlin, 1862) p. 114.

must not be regarded as a hindrance to the assumption of such limits. The unlimited progress of possible intuition on the part of the subject is no pledge that real intuition can go on indefinitely. Even Kant is obliged to ascribe to a "transcendental cause" the empirical conditions of this progress, "to whatever member of the series, and however far with reference to this member I may go in the series." This cause, according to his theory, is indeed unknown, but none the less given as a fact.¹ And in this sense we must understand his expression that by the rule constantly to go back in the series of phenomena to the next preceding member, "no definite empirical regressus going on without end in a particular sort of phenomena (*e.g.*, from one solar body to another without reaching the last) is to be assumed."² But is it not necessary that what applies to a certain sort of phenomena should apply to every definite sort. to phenomena in general?

It is certain that things become phenomena, objects of experience, only by perception. Objects of experience are never given "in themselves," but only in experience; and nothing can be real in space, the totality of external perceptions, until it has actually been perceived in space. But Kant himself teaches that the existence of things does not depend on their being perceived. If I assert that other planets are inhabited, or that changes have

¹ *Kritik d. reinen Vernunft*, p. 392 (cf. p. 390). The power of sense intuition is essentially pure receptivity, the capacity to be affected in a certain way by ideas. The cause of these ideas back of sense is wholly unknown to us (*i.e.*, its non-existence is not asserted, but we do not know its constitution), so we cannot have an intuition of this as an *object*. Still we can call the purely intelligible cause of phenomena in general the transcendental object, provided this means only the something which corresponds to sense as a receptivity. (It is only the name of *object* which is improperly applied to this cause which really exists.) We can ascribe to this transcendental object all the extent and connection of our possible perceptions, and can say that it is given in itself, before all experience. In accordance with this, phenomena are given, not in themselves, but only in this experience.

² *Ibid.*, p. 411.

taken place on the earth's surface before a sense consciousness was developed to perceive them, these assertions mean something quite different from a mere extension of the series of my perceptions beyond actual intuition. If the existence of inhabitants on Mars, granted that there are such, depended on their being perceived by men, that planet could never be inhabited. The same would apply to our own existence from the standpoint of a philosophising Mars-dweller. The geological changes before animal consciousness, which have left their impression on the surface of our planet, were never real phenomena. But who will thus be convinced that they never existed, and are mere ideas in the mind of the geologist? Existence is not dependent on consciousness, but consciousness on existence.

Kant does not consider the number of things in his solution of the cosmological problem. As a result he does not consider the mass of matter (this Wundt has emphasised). Kant has really no answer to the above question, whether the real is to be thought as the basis of a limited or of an unlimited world of phenomena. But this question must be proved necessarily, and from every standpoint transcendent, before it is reasonable to set it aside.

§ 3. The cosmological problem cannot be decided by inferences from experience, nor will the decision of it influence the results of empirical investigation. The laws of external nature apply only to the finite masses, and finite forces from which they are abstracted; if they are transferred to infinite masses and forces they lose their definite meaning, they change, as it were, their constitution. Problem and solution, as Budde remarked, can no longer be grasped after being thus transferred. Should contradictions with experience appear, as has been held, this is still no reason against assuming the infinity of the world. This assumption cannot be dis-

proved either directly or indirectly by scientific inferences; and consequently the opposite hypothesis, the finiteness of the world, cannot be proved by this means. Whether we assume that the world is infinite or not, in either case we only know and deal with finite phenomena.¹

Experience starts with sense intuition, and must return to it. The sense intuition of the universe is always limited, and however far we may think its limits extended toward the very great or the very small, we can never think them as disappearing, without causing intuition to disappear at the same time. This alone, however, does not warrant the conclusion that the limits of our intuition thus extended in thought would ever coincide with the limits of reality, nor that the real which sense knowledge limits in sensation and intuition, must have limits in itself. The real assumes limits for sense in its phenomenal appearance; it need have no limits apart from this phenomenal appearance.

Though intuition gives us a limited universe, we cannot think its limits as absolute. It involves contradiction to think limits, and to think these limits as absolute, because the very conception of a limit is relative. The idea of a limit involves the idea of something that limits, and the reverse. Each idea demands the other, and the two together form a single conception. The form of relation—limit, and that which limits—has in itself no end; as often as we think a limit, we must add the complementary idea of that which limits. But this fact that the form of relation has for us no end or bound gives no information as to the content which

¹ With reference to Zöllner's contradictions with experience resulting from the assumption that matter is infinite, v. Buddr., *Zur Kosmologie der Gegenwart*, Bonn, 1872, p. 17, *seq.* I agree with J. R. Meyer (*Naturwiss. Vorträge*, 1871, p. 7, and *Mechanik d. Wärme*, 2 Aufl.) that it is unnecessary to discuss the argument that the world will end in time, and therefore began in time, which has been drawn from the gradual elimination of all differences in temperature.

is apprehended in this form. The relativity of the concept of a limit does not mean the relativity and consequent indefiniteness of the visible universe. And it is not sense intuition itself, but only the concept of a limit which leads us beyond the external perception actually given, to a possible perception complementary to it. The intuition of the world in space is in itself complete, and as it were in a state of rest. The advance of representative thought beyond the given intuition is an imagined advance, an advance in phantasy, which must borrow images for itself from the real world of intuition. The subject must think itself in motion, it must put itself in thought on the outside of the sphere (more strictly the half sphere), the inner side of which it perceives in intuition. Who can think of a space which surrounds perceived space on the outside, as long as he does not go beyond the perception of space? We must make the intuition of objects itself an object of intuition, in order to go from the space we perceive to the space we think in imagination. This thought-space, as one may say this phantasy-space, is a mere creation of the mind, the product of a form of intuition; objects are given, not *in it*, but *with reference to it*.

The cosmological problem cannot, then, be solved by experience, nor by reflection on the subjective conditions of experience. Possibly it is one of those idle questions which are surrounded with a halo making them seem very deep and important, when in reality they only arise from a repetition of the question-form (as when one asks without ceasing for the reason of a reason), and to which consequently no answer is the correct answer.

We must, in fact, regard the cosmological problem as idle, if the understanding is alike free with reference to its different sides; if, as Kant thought, opposite answers could be proved by arguments equally sure and

convincing. In reality this is not the case. The question as to the quantity of matter is very closely connected with the principle that matter and force are constant and indestructible. The question whether or not the world is limited in time is likewise connected with the principle of causality, so that the empirical as well as the pure understanding makes these questions all-important, and urges their solution.

§ 4. Dühring has done good service, and that not to mathematics alone, in separating the indefinitely great from the absolutely unlimited. This analysis of infinity into two specifically different concepts, of which only one properly applies to quantity, is all-important in its bearing on the cosmological problem. As I shall make use of this distinction, it is necessary to discuss it briefly.

Dühring's example furnishes sufficient proof that the distinction in question is correct; for in pure mathematics the representation of a concept at the same time proves its reality. The tangent of an angle which is less than 90° by an indefinitely small amount, is, like the corresponding secant, indefinitely great. Every time the difference of the angle from 90° is lessened, the tangent and secant are increased by definite amounts. The point where the lines cut is constantly farther away, but so long as the angle differs at all from 90° it is a real intersection of the lines. "If the deviation from 90° is not indefinitely small, but is absolutely zero, there is no longer a real secant or a real tangent. The two lines no longer intersect, are unlimited." In the zero case, *i.e.*, for 90° , the concept of quantity does not apply to these lines, and this is true in the same sense as for an angle of 0° . An unlimited line has no greatness, but there is on the contrary an absence of any determination of greatness. In this way zero, on the one hand, corresponds to the unlimited, that has no greatness on the other. The case of the indefinitely great is different

from that of the unlimited, in that the possibility (of indefinite extension) does not appear as given in itself, but only as related to our activity. Farther, this latter possibility is always posited by individuals, and in each case the act is new and independent. In the indefinitely small there is room for various possible degrees of smallness; and this has its analogy in the room for variation within the indefinitely great. There is no such room for variation in zero; it is something definitely posited and complete, and so is the infinite. While the indefinitely great or small are still really quantities, zero and infinity are specifically different from all other cases. "The zero case differs from all others, not so much quantitatively as *qualitatively*,"—and this applies also to the case of infinity as distinguished from the indefinitely great. For this reason, "figures when dependent on the zero case or the infinity case, experience a change that is qualitative, not merely quantitative." The transition from the indefinitely small to zero, and from the indefinitely great to the infinite, involve, as Dühring puts it, a sort of leap. It is necessary to take away the indefinitely small remainder instead of merely positing it as constantly smaller before zero can be reached; and something analogous is required in going from the indefinitely great to the infinite. In a word, the unlimited, the real infinite, is different in kind from the indefinitely great, the infinity of which consists merely in successive repetitions which can only lead to finite quantities. It is no more a quantity than is zero. In going over to it we return to the form of intuition, *i.e.*, we leave every intuition, no matter how great. The schema of space is infinite, not the idea of space: the schema of time, but not any definitely given idea of time, is infinite.¹

¹ V. Dühring, *Neue Grundmittel und Erfindungen zur Analysis*, u. s. w., p. 88. Cf. Cantor, *Grundlagen einer allgemeinen Mannigfaltigkeitslehre*. Leipzig, 1883.

§ 5. The determination of quantity is not of various kinds; the only sort is the finiteness of a quantity. But an unchangeable quantity is finite. So because matter and force are unchangeable in quantity, they must be finite in quantity, for the infinite is no quantity, and the indefinite is no unchangeable quantity. The quantity of matter is determined by its mass, therefore, the total sum of mass in the universe is a finite quantity, or in other words the world is finite as to mass.

If it be assumed that the mass is infinite, this could only mean that no limit to it exists, that its quantity is not in any way determined. The absence of quantitative determination, however, contradicts the conception of mass, which is abstracted from the perception of different degrees of inertia in different bodies; therefore, mass cannot be absolutely without limit, because it cannot as a whole be thought without quantitative determination.

On the assumption that mass is infinite, the principle of persistence of matter and of force loses its proper meaning. That matter or force already infinite in amount cannot be increased, is mere tautology, an analytical proposition with no content that has any meaning. And because the infiniteness of mass can only be asserted as meaning that no limit exists, but that it is indefinitely great and still finite, while no determination of quantity can be applied to the infinite; the second part of the principle, viz., that present matter and force cannot be lessened, goes without saying, and does not need to be specially emphasised. On the supposition that matter and force were infinite, the principle of conservation would be no synthetical proposition of identity, nor would it be the correlate of the fundamental principle of causality, but it would simply repeat in a superfluous way something that goes without saying.

The principle of the conservation of matter and force is a fundamental proposition, which we cannot abandon

without destroying the unity of objective experience and the conception of the sense world. If we were to think the substratum of external phenomena as changing, whether increasing or decreasing, the relation of external phenomena to one and the same object would disappear, and nothing could be known through it. Objective experience in distinction from mere perception is only possible through the relation of external phenomena to one and the same persistent (quantitatively unchangeable) substance, *i.e.*, matter and force; just as empirical knowledge in general is possible through the relation of all phenomena to one and the same subject. So everything which turns out to be incompatible with the principle that substance does not change quantitatively, is excluded *a priori* from empirical knowledge. Neither the concept of an unquantitative infinite, nor of an indefinitely great is compatible with this principle; therefore matter cannot be infinite nor indefinitely great in mass. In regarding the principle of the persistence of force as a corollary of the persistence of substance, I am very far from making it in its physical meaning a fundamental proposition *a priori*. That *force also is substance*, *i.e.*, belongs to the persistent substratum of external phenomena, is the great discovery of the originator of the mechanical theory of heat.

That which can be brought under the conception of quantity is to be thought either as defined and finite, or as indefinite quantity. The mass of matter comes under the conception of quantity, because it belongs to the phenomenal appearance of the real for external sense, and so must be quantity, in accordance with the nature of an external phenomenon. It cannot be an indefinite quantity, because this assumption would permit an indefinite creation of new matter even to infinity. It must therefore be a defined finite quantity. It is not that we lack a perception of the creation or destruction of

substance (matter and force); we have no form of thought by which to think them, so that we set aside apparent experiences of this sort as soon as we reflect on them. We have no positive conception of infinity, but only the negative conception that a limit is lacking, that a hindrance to thought out beyond a given quantity (or in beyond a given minimum) does not exist. Putting together the two propositions, we are obliged to draw the inference that we cannot think the total amount of mass as infinite. (In order to think it as infinite, we must think it as constantly increasing according to the second proposition, and this would involve the assumption of a new creation of matter and force, which the first contradicts.)

It does not follow that matter is limited in space because mass is constant, and definite in amount. A finite mass can fill space even to infinity, it can be indefinitely great in the sense of the word above explained. This must be the case if the spatial distribution of matter were subject to a law that density diminished in relation to a higher power (at least the third power) of the distance from a definite point.¹ And the same result would naturally occur if beyond a given limit the repulsive forces of matter gained the mastery over the attractive, so that the distance of the parts must constantly increase. On these presuppositions, the spatial quantity of matter would come under the Kantian rule of progressive connection between external phenomena. In other words the extension of matter would be indefinite, it would go on indefinitely. Matter would not have a definite spatial greatness at any given time. Its extent in space would be limited only in reference to an absolute point in time, and because no such point in time actually exists, its greatness would never be definitely determined. That we presuppose

¹ Wundt, as cited, p. 497.

in thought such an unlimited space, filled indefinitely with matter, as present, that we as it were put space before its occupation by matter, means nothing else, in the terms of our critical theory, than that the size of the sense world is constantly growing in reference to the space-schema of its perception.

We do not know the law according to which matter is distributed in space, we do not even know whether there is a single law of distribution for matter, so that we cannot answer the question as to the extent of the world in space. Nor does this question belong to the critique of conceptions, but, as Schopenhauer has shown, it is to be answered by empirical investigation. How could one decide from concepts how great must be the phenomenal appearance of the world in space?

The more modern observations in astronomy do not support the hypothesis that the mass of the universe is distributed about any one central point, for no regular arrangement of the star-system in space is found, nor any motion of the same in the sense of a single related system. This removes the reason for thinking that absolute or mathematical space has any correlate in reality. To-day, instead of seizing in advance some knowledge scarcely possible in the future and talking of a system of systems, we must be content to limit the mechanics of the heavens, proudly so called, mainly to the mechanics of our planetary system.

The problem of the extent of the world in space is connected with assumptions in regard to the qualities of matter, which must be established by the empirical, not the pure, understanding. Most prominent among these assumptions is the atomistic theory, which is absolutely necessary in the representation of chemical processes. No one will claim that it is necessary from the standpoint of pure thought. One service which philosophical criticism can render to positive investiga-

tion, consists in securing to such investigation freedom in forming hypotheses, and in preserving science from the power of dogmatism. An infinite number of atoms (more correctly, of groups of atoms, *i.e.*, molecules) simultaneously present, is not thinkable, because a given infinite number is a self-contradiction. But apart from the fact that this decides nothing as to the extent of the material universe in space, it is conceivable that besides matter in form of molecules, there may also be a matter that does not consist of separated elements.

§ 6. As the idea of the quantity of mass is determined by the principle of the persistence of force, so the idea of the existence of the world in time is more definitely determined by the principle of causality. The assumption that changes in nature have a beginning is necessarily excluded by this principle.

We must distinguish causes of phenomena from reasons for phenomena. A reason is that in the cause which makes the effect conceivable. A cause becomes a reason, when it stands under the law of quantitative agreement with the effect. This, however, is only the case with reference to causes in the external world. Only these are quantities, in accordance with the nature of external sense, and stand empirically under the principle of quantitative agreement between cause and effect. All causes, even causes of inner phenomena agree in this, that they are changes, *i.e.*, changes of states in one and the same thing. As changes they stand *à priori* (from reasons of the pure understanding) under the principle of causality, in accordance with which the cause of a change is to be sought in a preceding change, for which the same is again true, &c., to infinity. A change is not in itself conceivable. It presents itself to the mind as something dependent, and as it were fragmentary, impelling the mind to complement it by a preceding change which again wakens the same need, and so on

indefinitely. There, are, indeed, final reasons for phenomena, fundamental relations of being and of change, by combination of which the compound processes in nature are explained; but there is no last cause of phenomena, because the assumption of such involves the contradiction of a completed infinite number. So we infer from the "law of definite number" the opposite to Dühring's inference; not a last, *i.e.*, a first cause, but the impossibility of assuming such a cause. The objection may be made that the principle of causality presupposes the actual occurrence of a change, and so establishes nothing as to the origin of change in general. Changes must first be given, in order that the principle of causality may be applied to them. But the origin of change is itself a change, which, as such, must be subject to the principle of causality. An absolute beginning of changes is not thinkable, because such a beginning would still be a change, for the existent before this beginning must differ from the existent after it. As change, however, a beginning cannot be absolute; it has its cause in a preceding change, the cause of which must be sought in a change situated farther back, and so on.

The causal series of phenomena undoubtedly extends to infinity. An absolute beginning of change in nature, of the varying interplay of events, is necessarily excluded; it is impossible. This impossibility is as fixed as the necessity that change be controlled by causality. A first cause with which as a creative act the series of changes should have begun originally, would be an uncaused change. The necessity of conceiving every change as effect which has its cause in a preceding change, makes such an uncaused change absolutely unthinkable.

The world has no beginning in time. A substance has always been in the world, so also variation of its states, a series of changes, has always existed.¹ The conception of substance unites existence and activity. Substance is the

¹ *Kritik d. rein. Vernunft*, p. 357.

persisting existent, and the continuously active in the world. Its activity cannot be separated from its existence; a first beginning of change is as inconceivable as a creation of the substance of things.

If, then, Dühring gives reason for assuming a changeless state of the world before its development in time began, and assures us that this proof is more severe and accurate than mathematical proof, there yet must be some flaw in it, for the assumption contradicts the logical principle of causality. This flaw lies in the presupposition that change in reality falls apart into independent separated sections, that in itself it is numerically articulated. We have already shown that this presupposition is incorrect. It is our apprehension which analyses the current of events into a number of single processes; and these only seem independent because they proceed from things in space, and are communicated to other things in space. The beats of a pendulum are undoubtedly determined numerically, but the action of gravity producing them is continuous and unbroken. If the effect of gravity is analysed in thought into a number of elementary impulses, we can only see in this analysis a mathematical expression which has no more real meaning than, *e.g.*, the idea of an infinite number of points between the ends of a given line. The contradiction lies simply in the assumption of a given infinite number. But states of matter are not given in constant change; they possess no independent existence; they are a continuous process, given with no interruption, and so are never to be thought as separate and completed. Between one change which I fix in thought, and the one immediately preceding or following, there is not really interposed the least moment of empty time, in which nothing happens. Changes do not form in themselves a series of separated events. Rather, change in nature is continuous and unsuspended through every present. It involves no contradiction to think the

series of changes, if we can use such an expression, as unlimited in the past, *i.e.*, without beginning, and as extending indefinitely into the future, a quantity constantly increasing; the simple reason is that such a series is like time itself, which is the abstraction of its form, it does not increase by separated processes. And it is as certain that this series is unlimited as that a change without cause and without effect is excluded *à priori* from our knowledge. If the idea of the infinity of the world in time is too great for our imagination, it is not too great for our understanding, for which the absence of a first cause is a necessary thought. The law of definite number, the objective validity of which is secure from attack, has no application to the series of changes, because this sequence is not given in itself with numerical determination.

The assumption of a beginning, a first state of the world, involves the further assumption of a producing or creative act for the first change, and with this undoubtedly we go beyond the limits of possible knowledge.¹ That state of being before creation in time, which Dühring assumes and describes as a motionless state of homogeneous matter, belongs rather to the sphere of mythological thought than to the realm of scientific cosmogony. So we are convinced, even without the express declaration of the philosopher, that his conception of an original state of matter is not to be brought under the rubrics of investigation. It really goes without saying that the conceptions of "our present mechanics" do not suffice to characterise the state assumed. For if we were to think the "so to speak undisturbed equilibrium of matter" in accordance with these conceptions, "then it would be impossible to understand how matter came into a play of changes." It only appears certain that this assumption of beginning change would necessarily transcend the reach of these conceptions,

¹ The following is in harmony with Dühring, *Cursus der Philosophie*, p. 79, and *Logik*, p. 191.

whatever may be the expectations cherished with reference to future mechanics and its discoveries. Dühring himself grants that "the absolute identity of that original limit-state carries in itself no principle of transition to the state of change." We are not to think here of the distribution of matter, and of the force connected with it, for this distribution is a change, and not an original act of production. And the reference to the appearance of "new specific forms" in nature does not make the origin of change any clearer, for this appearance is not an uncaused creation, but development through change. We do not experience any other origination except change, so that our inferences from experience never reach an original state of reality that is wholly devoid of change.¹ "Because there can be no principle of transition from the changing to the unchanging," there is no advantage in inserting numerous intermediate states in the series toward an assumed beginning of change. Even if there were no limit to such approach, we could come no nearer the state in question than we stand now in the present moment. In order to be able to think it we must step out of time by abstracting from it. But when once we have abstracted from time, the idea of *before* and *after* has lost all meaning. The beginning of things is no nearer us, and no farther away than any process in the world which we make independent by thinking it as isolated. Any process whatever may be regarded as the original state of the world, and we could say with a certain measure of truth that the world begins anew constantly, and with every process, just as it is constantly at the end or goal.

¹ The inference to a future without change and therefore to an end of the world in time, is only apparently established by experience. The theory of heat, at most, points to a limit-state, which development in time approaches indefinitely, but never reaches in any real time. This approach, too, applies only to separate systems in the world, and not to the world as a whole, if, as we assume, the development of the universe in time does not start from one single point, a single absolute original state.

§ 7. Beginning and end are ideas which apply to relations of phenomena in time; for this reason they have no applications to the world as a whole, which does not stand under relations. We follow a natural illusion in making our own existence in time a measure and type for the existence of the universe in time; it is easy to assume that the world's existence is enclosed between two limit-states, just as our individual life is enclosed between life and death. It is certainly interesting to the philosopher that the very word *world* (*Welt*) meant originally a period of time and applied especially to human life on the earth, while a second meaning of the word has reference to the collectivity, mankind.¹ The life of the race, as well as of the individual, has limits in time, and, as science teaches, the planet we inhabit, and the solar system to which we belong, are subject to the fate of all particular things; they grow old and die. Everywhere in nature the inference from the present phenomenon leads us to a relative origin in the past, and to a relative end of things in the future. Everything which has come into being shares the lot of our life, our planet, our sun. It might appear that what is true of every single series of phenomena, must also be true of the world. This conclusion would be over hasty; it would transfer determinations of relation to the whole, which itself is not to be represented in concepts of relation, but is rather to be thought as the basis which makes such relations possible.

Time is a concept of relation. Duration and change, the form of persistence and the form of variation are united in it to determine each other. But the world-whole is no concept of relation, therefore time can no longer be applied to the whole of things in the same sense in which it is applicable to particular things and series of things.

There is one standpoint for the thinker in his study of

¹ Kluge, *Etymol. Wörterbuch der deutschen Sprache*, p. 369 (3 Aufl.).

the world for which the conceptions of past and future lose their meaning. In the whole of things nothing is to be thought as future, and nothing as past. This thought, negative though it be in expression, may be partially represented in imagination as follows. It is possible to think all states and all stages of development as existing in the universe at the same time, and this idea acquires a basis in fact, when astronomy reveals to us fully formed solar systems and at the same time unsolved masses of nebula, the birthplaces of future systems. A first state of the world in the far distant past, could only have been one single state. In this case the development of the world in time would necessarily converge in the direction of the past. This assumption is at variance with the observation of the heavens, which shows us collections of gaseous matter, together with articulated systems; and in rare cases it bears witness to the destruction of a world, when a star blazes out brightly, and then dies away. The scattered cosmic masses in different stages of development give no indication of regular arrangement and a common centre of motion, so that they give no support to the inference of a common origin in time. Observation does not suggest the assumption of a uniform development-series of the world, but shows on the contrary that all possible stadia of development exist in the world simultaneously. From this we infer that the concept of development, and of any sort of change can only apply to parts or partial systems in the world, not to the world as a whole. If now we were to think a consciousness which embraced all the stages of development existing simultaneously in the world, to which all these stages were present in like manner, then this consciousness could distinguish neither beginning nor end in the world. In its intuition, beginning and end, and all intermediate stages of development would be given simultaneously, and with reference to the same object—

the world in its entirety. The ideas of past and present must be unknown to it, as well as the concepts of means and end. It would apprehend the plenitude of reality in a continuous present, and for this present, relative duration of time would have as little meaning as relative change in time.

The application of the idea of space to the world as a whole, may be discussed in the same way as the application of the idea of time. The sense world is the totality of external phenomena. It has spatial greatness, though perhaps no definite limits in space. The world is not merely phenomenon, it is the basis of phenomena; as such it cannot come under spatial determinations, which belong merely to the perception of it by external sense. The basis of spatial phenomena, is not itself a phenomenon in space.

We leave the concept of spatial greatness, and of all determination of relations in space which are valid only for intuition, when we go from the phenomenal world to the concept of the world as the basis of external phenomena. This transition is analogous to the transition from the indefinitely great to the absolutely unlimited, or the corresponding one from the indefinitely small to zero. The unlimited, and zero as well, can be used as symbol for the thought that the whole of the world is not subject to any quantitative spatial determination. Perhaps it should be understood in this sense when G. Bruno calls the basis of the world, which means for him God, the maximum, and at the same time the minimum. But even without using such symbolic expressions, we may see that the world in itself, apart from its phenomenal appearance to external sense, does not come under the concept of spatial greatness. Quantities in space can only be determined by comparison with a quantity selected as the unit. But there is nothing outside the whole of things with which it can be compared.

The question as to the size of the world as a whole has no intelligible meaning. However, we cannot assert that this whole is an object of cognition. It is rather a limit of cognition. The concept of the real as the basis of phenomena, is a limit-concept, which is not embraced by any idea, but which rather determines every idea.

Senseless and absurd as it may appear from the ordinary point of view to say that the world itself does not exist as a spatial world, this reversal of common conceptions is necessary, unless reality is to be transplanted into a void, and made dependent on the void. There can be no doubt that the idea of space underlies the ideas of relations in space, because it alone makes these relations possible. If space itself were not mere perception, if it did not as such depend merely on the formal constitution of external sense, then things would depend on empty space, just as the spatial perception of them depends on their relation to the space-schema of external sense. Things limit each other in sense intuition; their reciprocal activity is perceived in the form of sense apprehension, as relation in space, position, and distance; and the change in their effect, as change of spatial relations, bringing them nearer together, or farther apart. But all these relations, distance, position in space, shape, do not exist outside of perception in the form in which they are perceived. Only that which determines the intuition of space is given, not this intuition itself.

All concepts which are related to a whole, are related thereby to an unchangeable. So mass, although it belongs to the phenomenal appearance of the world for external perception, is unchangeable, and the sum of force in the universe is likewise unchangeable. For the same reason the world as a whole is to be thought as without change. All change takes place in the world; the world itself, as a whole, does not change. This fundamental conviction that reality as a whole is unchangeable, is also expressed

by the principle that every change has its reason. This principle prescribes the search for the reason of any effect in some cause which agrees numerically with the effect. If the sum of all causes in the world is equivalent to the sum of all effects, this simply means that however often there may be change in the phenomenal appearance, no change takes place in the totality of things.

The answer to the cosmological question, which I have attempted to give in the preceding, may be summed up as follows:—The phenomenal world, which alone is the object of our cognition, is of unchangeable and therefore finite quantity as to mass; its extent in space does not necessarily have definite limits; in time it has no limit in the past, nor barrier in the future.

If, however, the cosmological problem is put in general form, and not limited to the appearance of the world for sense, only a negative answer can be given. The concept of quantity does not apply to the basis of phenomena. Quantity belongs to the concept of relation (nor does this prejudice its reality); but we can only know relations in the totality of things, we can never know this totality in relations. Not only do we lack any conception of the size of the world, the very question has no meaning. As the existence of inner phenomena testifies immediately, the world does not exist as itself mass, or material nature. The quantity of mass, and the extent of it in space, *plus* the sum of all processes in time, does not exhaust the "quantity" of the world as a whole; this whole does not come under a concept which is abstracted from the effect of things on conscious beings.

In conclusion, I merely mention one difficulty which might stand in the way of our view. From the assumption that mass is finite in connection with the infinity of the world in time, it seems necessary to infer that the same phenomena must be repeated in the world with no limit to their frequency. The reply might be made that

the early Greek thinkers found no difficulty in this idea of the repetition of events, but in fact our assumptions do not justify the inference suggested. Finite mass may enter indefinitely many combinations in unlimited space, so that the phenomenal world need not be repeated even once in infinite time. If a new world-system takes the place of one that has been destroyed, and this may be the case, the processes within the system, including life perhaps endowed with reason, need not follow exactly the same course as in the preceding system. Nature unites in its effects individuality and universality, singular series of phenomena, and universal laws of phenomena.

CHAPTER V.

NECESSITY AND ADAPTATION.

§ 1. MAN is not the measure of all things; he *makes himself* the measure of things when, following a natural and almost unavoidable illusion, he finds his own personality in the external world after he has first put it there himself. As an acting being he regards things as means because and in so far as he is able to utilise them for his own ends; as a thinking being he considers things as like the perceptions and concepts which he obtains from them. He believes that they possess in themselves the characteristics and specific form which they assume in his sensation and intuition. And even the æsthetic impression which certain external phenomena make upon his susceptibility to feeling and his judgment of worth, he is inclined to project into the objects themselves. The beautiful, wherever it appears to him, *i.e.*, wherever (on occasion of given external relations) he creates it unintentionally in them, seems to him a gift of nature, which he regards as due to nature.

Critical philosophy and positive science unite in the effort to destroy this natural illusion, or at least to prevent it from any longer deceiving the mind of man. The heliocentric theory of Copernicus, which Kant compared to the critical mode of thought as contrasted with the dogmatic, did not change at all the immediate sense intuition of the rising and setting of the sun; but it raised the mind of man to a standpoint from which he recognised the necessity and at the same time the

relativity of the direct sense phenomenon. In like manner the critical philosophy cannot indeed transform external intuition itself, but it can prevent man from continuing to confuse the results of his intuition and thought, perceptions and objects of experience, with the causes of his intuitions. In the effort to accomplish this, philosophy recognises its agreement with the most advanced positive science. That which this latter accomplishes in detail by criticising particular spheres of experience, the former aims to accomplish in general by criticising experience as a whole. It goes back to the sources of experience, and furnishes the proof that all the qualities which belong to the intuition of a thing, as well as the form in which the intuitions are united into the concept of the object, are alike conditioned by the qualities of the perceiving and thinking subject. By thus giving a clear insight into the reason of this anthropomorphism, it frees the mind from the power of this natural and apparently unavoidable mode of thought. In no phenomenon of the external world do we have before us the unmixed essence of the thing which appears; and because we have a share in every outward phenomenon through our own feeling, perceiving, and thinking activity, the external world, as it appears to us, must always reflect at the same time a part of ourselves. This self, moreover, we never know, except as related to and reacting upon the outward phenomenon. Knowledge of self enters as one component into our knowledge of the world, the other components of which are formed by the nature of the things which affect ourselves. Experience consists of this reciprocal relation of outer and inner.

Undoubtedly everything which belongs to the subject is grounded in the nature of things; but it is not identical in kind with the thing which is its cause. *E.g.*, in the constitution of a sensation the quality of the feeling

activity cannot be distinguished from the quality of the felt stimulus; accordingly, as we are convinced, it is as incorrect to regard a sensation (*e.g.*, of an odour) as exclusively subjective, as it is unreasonable to explain another (*e.g.*, solidity and extension) as completely objective. Nor is thought a purely subjective activity. Thought is itself a real process with a real apparatus to produce it; more than this, thought cannot, in fact, be isolated from its objects and the relations of its objects. In these objective relations, then, there must be something analogous to the activity of thought, something corresponding to the form of this activity, else this activity could not arise. Even the æsthetic impression which taken by itself is unquestionably a subjective process, presupposes the co-activity of objective relations of form with the idea of which it is indissolubly connected. The apprehension of the *real* outside us according to analogies with our own being is not anthropomorphic in any unfavourable meaning of that word; for it is not possible to know any other kind of external world. In order to avoid real anthropomorphism, it is only necessary to be on one's guard against treating the analogy as an identity in kind, and transferring to external nature specifically human concepts and such forms of apprehension as are first developed in the world of social life.

It remains to apply these general standpoints of the critical philosophy to the problem of necessity and purpose in the phenomena of external nature.

§ 2. It is ordinarily held that the concept of necessity is an objective form of apprehension, while the concept of purpose is purely subjective; and inasmuch as men are accustomed to treat the objective as the real, reality is attributed to the concept of necessity alone, while purpose is regarded as an Idea in our mind. In form, however, this antithesis is without reason. One must admit that

the concept of purpose is objectively valid in the same sense that necessity is. The distinction between the two concepts consists only in the greater universality of the latter as compared with the former. The concept of necessity is the more universal concept, which includes that of purpose as the more particular. In other words, under certain conditions it is not only necessary that ideas of purpose should arise; the nature of a definite being provided with consciousness farther determines what definite idea of purpose arises and guides the actions of this being. Farther, since the acts of the will are real processes, just as much as the processes of motion in nature which are clearly phenomenal in their external form, the principle of purpose must acquire real meaning if the principle of necessity has such meaning. In another sense, moreover, necessity is no less subjective than purpose. *I.e.*, if one limits the objectively real to that which is given in our experience without any addition from our own consciousness, if the real is limited to the relations of phenomena, the concept of necessity can no longer be spoken of as objective. There is no necessity in the things themselves apart from their relation to our understanding, any more than there can be anything of purpose in them apart from relation to our will. It remains to speak later of the adaptation of external phenomena in their relation to the understanding. It will be shown that this sort of adaptation coincides with the concept of necessity, and that, too, with necessity in the sense of mechanical causality.

It is important to notice the objective factor in the concept of necessity, *i.e.*, the occasion in the relations of the phenomena themselves, which causes this concept to arise in our minds.

In the scientific meaning of the word, necessity is the same as obedience to law. But obedience to law expresses the effect on the mind of the constancy and uniformity of

phenomena. These relations of objects we transform in experience into laws for our thinking; in other words, the regularity with which under like conditions the same phenomena appear, and the constancy in the fundamental attributes of things, first assume the meaning of laws when they are brought into relation with the knowing activity of the subject. Obedience to law is the same thing for the understanding as purpose for the will and beauty for the æsthetic sense; and it is possible to assert that obedience to law could not exist without relation to the understanding, any more than beauty without an æsthetic sense, or purpose without a will that sets ends before itself.

It is no mere accident that the so-called laws of nature agree with the laws of thought; in their form as laws they are the result of the laws of thought. The understanding regards as subject to law all that which must be presupposed in nature, in order that knowledge of nature may be possible. Accordingly the unchangeable qualities of objects appear to us just as much subject to law as the forms of change which continue constant under like conditions. Even the constant quantities in nature, the heat equivalent, the atomic weights of elements, and chemical affinities, are counted among the law-abiding factors of external experience, because they make possible the knowledge of the empirical, just as the unity of consciousness makes possible empirical knowledge in general. Everything known thereby stands *a priori* under laws, for obedience to law is the form of knowledge.

In reference to the general prevalence of law, there is no difference between inner and outer experience. The states of inner experience also show uniformity in their succession, and so obey law for the understanding which perceives them. But the concept of the universality of law may be more exactly defined with reference to the phenomena of external nature; here it obtains the mean-

ing of mechanical causality. The succession of inner states is the succession of non-homogeneous phenomena; and although their connection is derived from the feeling that one state depends on another, still in inner experience (if we first set aside the relations of purpose as a particular kind of causality) there is lacking the possibility of making the series of states conceivable, *i.e.*, of reducing it to the logical relation-form of cause and result. This possibility does exist for the connection of external processes, and this is the true reason why we prefer the mechanical explanation of these processes to any other explanation. The external phenomena are not indeed homogeneous, as they are directly perceived by sense, but in virtue of the fundamental form common to them all—extension and measurable quantity, they may be transformed into homogeneous concepts. External cause and external effect are as quantities homogeneous, and farther, since the mechanical cause and the mechanical effect are identical in quantity, the connection between them is analogous to the connection of reason and conclusion. This does not indeed mean that cause and effect in mechanical nature are the same as reason and conclusion in thought—mechanical events are not thought-processes—it means that their relation corresponds to that of reason and conclusion. The mechanical explanation truly assigns the reason.

In the effort to explain mechanically, without introducing any other principle, all processes in nature, not even excepting the psychical processes on their physiological side, science is guided by the universal principles of the knowledge of nature which have their source in the laws of thought. Philosophy makes clear this process which has been rightly followed in science, by assigning the reason for it. Accordingly there is full agreement between the fundamental principles of the critique of knowledge and the practical method of scientific investigation.

In order to understand rightly the principle by which mechanical reasons are assigned, we must go back to our distinction between causes and reasons. The causes of mechanical change: impenetrability, pressure, blow, elasticity, are unknown to us so far as their true nature and mode of action are concerned, or more correctly, they are known to us only as phenomena in the mode in which they affect external sense. The so-called forces which determine acceleration, are indeed nothing unreal, as has been asserted by a scepticism which evidently goes too far, for they are abstracted from perception, the reality of which cannot be doubted; but they enter into our consideration of mechanical processes, not as causes the nature of which would be known to us, as for example the motives for an act of will, but merely as formal concepts, as reasons for mechanical changes. So the assertion that every event in nature is itself mechanical, is false if this is intended to refer to the essential character of the event in nature. The mechanism of things does not express the essence of a natural process; it sets forth the form of the natural process—more exactly, the phenomenon of this as it appears to sense. Not enough is said when the problem of mechanics and so of natural science is stated in the following language: "to describe completely and in the simplest manner the motions that take place in nature." For a description given in accordance with the laws of logical and mathematical thinking, is anything but the assignment of a reason. And yet that statement of Kirchhoff's contains a deep and important truth. It draws the line between giving a mechanical reason and explaining from causes themselves, and so it comes into conflict with dogmatic materialism. Mechanics gives the reason for the changes that take place in nature, but it does not reveal the essence of the causes of these changes. When once we are convinced of the formal character which pertains to reasoning in mechanics, it

no longer seems to us impossible that the mechanism of things should involve life and sensation, even though we cannot understand any better how this should be the case.

§ 3. The study of causes from the standpoint of mechanical causality may take two forms, according as it proceeds from cause to effect, or goes back from effect to cause. The former we call direct, because it follows the course of perception; the latter indirect or inverse, since it goes back from the perception of a present state to the idea of one that has preceded. The judgment of causality is analogous to the thought-relation of reason and conclusion, in that it, like this, permits a reversal, which, however, is subject to a limitation corresponding to the limitation in converting a logical syllogism. If the premises of a conclusion are given, the inference to this conclusion is completely determined. But the inference back to the premises is also fully determined if the complete conclusion is given. The totality of the results is equivalent to the reasons, the totality of the propositions forming the conclusion is equivalent to the combination of the premises. If, on the other hand, only a part of the conclusion is given, the inference back to the premises is undetermined. The inference from the occurrence of the result to the occurrence of a definite reason has only greater or less probability. But we know with certainty in such a case that something which we look upon as result, not only has some reason, but has a reason which is homogeneous with the result, and is a sufficient reason for the result. A sufficient reason is a reason partially identical with the result. For since the result is thought as contained in the reason or posited by it, it must, so far as this is the case, be identical with the reason. If we possessed complete knowledge of the mode of distribution of mechanical force in a given instant, if we knew all the states of matter at this instant, then we

should have the power to infer its states not only for every following point of time, but also for every preceding point of time according to the laws of mechanics. But now we really know but few of the mechanical states of nature, and these only singly; although we can infer with certainty from the states known to us as causes to the states immediately following as effects, the reverse inference from the effects to their causes has only greater or less probability, for, as we know in experience, there are several ways of producing the same mechanical results. In reversing the causal judgment, we can presuppose with certainty only this, that the cause to which we infer back, whatever its more exact physical constitution may be, must be equivalent to the given effect in mechanical quantity—as soon as we mean by cause not merely the outer occasion of the change, but the inner arrangement of the mechanical system from which the effect proceeds. In order to produce the given result, a cause of definite quantity is necessary; or more exactly, the mechanical energy of the cause remains the same, it only changes the form of its appearance in the effect. The mechanical energy remains, for the very reason that it is only the quantitative concept of energy; in whatever form it may appear, the total sum remains the same and unchangeable. The principle of the persistence of force makes it possible to reverse the causal judgments in regard to external phenomena, and this reversal is exactly like the logical conversion of the syllogism.

The inverse judgment of causality is by no means transformed by this reversal into a teleological judgment, a judgment of means and end, as is often asserted. It is distinguished from the direct form merely by the direction we take in going through one and the same content. We proceed analytically when we infer from result back to cause (for the effect consists in the connection of the causal moments), synthetically, when we deduce the

effect from the cause. The constitution of a judgment—the ground of the unity connecting the parts—cannot be changed by mere reversal. If the direct judgment is a proposition of mechanical causality, the inverse judgment must be such a proposition also. In reversing the causal judgment there is no reason for adding the specific thought that the result, to the presuppositions of which we are going back, must be the goal toward which the causes are directed.

From the standpoint of the result the causal series does seem to us like a series of means, and this is particularly the case in studying a complicated result which could only be produced by a definite combination of causes. It is necessary to take care not to be misled by the analogy with a machine, when one attempts to understand the composition of a natural mechanism from the standpoint of the result. Natural mechanisms are not machines, although in the inter-relations of their parts they may be compared with machines. The result is the resultant, not, as in the case of a machine, at the same time the principle of the arrangement of the parts; it is the final effect, not a final cause. In every mechanism the final result is indeed determined; but only in the case of an artificial machine is it at the same time a prescribed result. A result which is introduced by a definite arrangement, can only be called an end when the idea of the result precedes the introduction of the arrangement. The similarity between a mechanism in nature and a machine is only superficial. The resultant effect of a natural mechanism grows out of the effects of the smallest parts; what a machine accomplishes is the result of the motions of coarse parts, visible to sense. In the case of the machine the whole precedes the parts, so far as the parts are fitted together according to the idea of the whole; in the mechanism the parts enter into the common activity with their

complete natural independence ; the whole is the product of parts, which retain in it their independence.

§ 4. As long as we do not bring into connection the final result, the causal conditions of which are reached by inference, and the idea that the result is in some way aimed at by nature, the explanation of the result remains a reversed judgment of cause. It remains so still, even if the idea of an end sought is involuntarily forced upon us in studying the result, provided the explanation itself is given without the additional thought of an end. This applies, I believe, to all the apparently teleological explanations of organic processes, provided that these are real explanations, and not inexact descriptions.

Close as our thought of organic nature may be to the standpoint of ends purposely sought, the knowledge of organic nature does not proceed from this thought, and cannot proceed from it, because purpose is not a concept of the pure understanding, not a logical principle for the unification of thought, but rather a practical principle, a principle of the will. The idea of the adaptation of an organ arises from the voluntary use of that organ ; to use an organ and to explain its working and its development are two very different things. Insight into the structure of an organ and the laws of its development is not in the least increased when the organ is thought of as expressing purpose, and so its action is related to will. The very term organic does indeed include in its meaning the relation to use, and so to a purposed end ; and this same relation, as Dühring rightly remarks,¹ lies hidden behind the apparently indifferent expressions : function, and adaptation to the conditions of life. But, at most, this could only prove that in introducing these terms the teleological description of organic phenomena was still usurping the place of true explanation. It does not prove that teleological standpoints are indispensable for

¹ *Cursus der Philosophie*, p. 52.

the understanding of organic nature. The man who does not stop with the words used in a scientific explanation, but goes on to the concepts on which the explanation is really based, cannot escape the conviction that as yet no explanation of an organic phenomenon has ever been given by proving the presence of design—except in those cases in which possibly the organisation of a living being may have been affected by the reaction of spontaneous acts, *i.e.*, by really purposeful activities. Design is not a principle, but rather a problem for the science of organic nature. It is easy to confirm this statement by examining the procedure of the study of organic nature.

Without question we think the relation of function and organ according to the analogy of end and means, and it must also be granted that we use the suggestions of this idea in order to obtain a general knowledge of the structure of an organ. But when it is asserted (as by Kant), that without such suggestions as to the inner form of an organised being we could not carry the investigation far enough to become sufficiently acquainted with this form, *i.e.*, that such acquaintance depends on the concept of end, a great exaggeration is evident. In the finer structure of an organ, the connection between its functions is made clear to us by histological investigation and physiological experiment, not by studying ends. At most, the search for ends can only afford general guidance in the study of complicated mechanisms and functions, but it can teach nothing as to the causes of these functions and the elementary parts of the mechanism. Teleology belongs, as even Kant has remarked, to the description of nature, not to the science of nature. In the sphere of organic investigation it corresponds to the standpoint of immediate sense intuition and a judgment of objects based on this, while physiological experiment represents the standpoint of scientific knowledge. Nor is it diffi-

cult to see that it is not the teleological judgment as such, but the reversed relation of cause, the inference from function as effect to the organ as cause, by which the agreement between the structure and the functioning of an organ is really explained. So it is not the purposeful factor of this agreement that is explained, but the mechanical factor, which proves itself adapted to produce the result. We do indeed use the expressions *end* and *means*, but we mean by them effect and cause. When Harvey, by reflecting on the possible use of the vein valves, was led to the discovery of the circulation of the blood,¹ he was guided by the idea of the mechanical operation of such an arrangement, and in this way explained consistently the mechanical form of this circulation. In order to understand the dioptric apparatus in the eye, it is not sufficient to know in a general way, or rather to assume, that the eye was made to see; we must start with the physical conditions of vision, the laws of the motion of a ray of light through a system of refracting media. If, however, we possess the knowledge of these conditions, in seeking to understand that apparatus we can entirely abstract from the idea that to us who use the eye and know its utility, seeing must appear as the end of the eye. (Nature develops eyes which never see, *e.g.*, in embryos which perish before they see the light. How then can seeing be the final cause that determines the formation of the eye?)

There is an example that proves conclusively that the study of ends is of no use in making clear the connection between function and organ. The psychical processes are undoubtedly functions of the central organ of the nervous system. But the view which regards them as the final ends of this organ does not make its internal apparatus any clearer, nor are the psychical functions as such to be understood from the apparatus of the brain. And the reason is very evident, namely, that these

¹ Spitzer, *Beiträge zur Descendenztheorie*, Leipzig, 1886, p. 442.

functions cannot be represented as mechanical phenomena ; rather the reverse is true, the perception of mechanical phenomena presupposes psychical processes. Here, because the assumed ends of the organ are not at the same time mechanical effects of it, no conclusions as to the structure of the organ can be drawn from them. It is a safe inference from this, that in the other cases also in which apparently a conclusion is drawn from the relation of means and end, the conclusion is really drawn from the mechanical connection of organ and result. All apparently teleological conclusions from known function to the inner form of the organ are in reality reversed judgments of cause, and that, too, judgments from the standpoint of mechanical causality.

The function being given, it follows from this necessarily that its conditions must also be given in the arrangement of the organ to which the function is attached. The analytic explanation of the organ which starts with its function does not need the concept of a final cause, of an end. Not because the function is adapted to its end, but because it is mechanical, is it the means for understanding the mechanical arrangement of the organ. Nor does the synthetic explanation of the function from the anatomical structure of the organ require the idea of the organ as the definite or designed means to produce the result as the end. The only remaining question is whether the development of organs and the existence of functions is to be understood teleologically.

The physiological explanation of a given organism finds its limits in those features which are introduced by its relations to other organisms, particularly in those means of defence and adapted characteristics which have proceeded from the interaction of living beings with each other. Organisms appear not only to show design in their internal arrangements ; in their external characteristics that seem purely morphological they bear

the stamp of relative or external design. If then all functions of the organism (except the psychical functions) which form the basis for its phenomenal appearance, are to be explained mechanically, still the understanding of the peculiar form of a living being, or of its organisation in general, might make necessary the assumption of teleological principles. Kant gives expression to this conviction in the "Kritik of the Judgment."

According to Kant, the concept of end or purpose is not a principle of the knowledge of nature, but a mode of judging certain forms in nature, namely, its organised products. Such is the constitution of our powers of knowledge, indeed so limited are these powers (as Kant says), that we cannot think the connection between the parts of an organism and the whole without presupposing that the Idea of the whole determines the form and connection of all the parts. We think the organising force of nature as analogous to causality aiming at ends, and yet we do not "presume to offer this as an explanation of it." So the end is not the principle according to which these organic forms are created, but merely a mode of judgment which arises in our reflection about these forms, and which is related to the æsthetic judgment of objects. Properly, teleology belongs "only to the description of nature, not to the theory of nature; it gives us no valid conclusion as to the origin and the inner possibility of organic forms."¹ "To speak exactly, the organisation of nature has nothing analogous to any causality which we know."² The idea of end, Kant continues, "is a stranger in natural science;" the mode of thought which uses final causes is a "help in necessity, which indeed succeeds in many cases; but it is not justifiable in all cases to introduce into natural science a particular mode of activity in

¹ *Kritik der Urtheilskraft*, Werke IV., p. 310.

² *Ibid.* p. 258.

itself different from causality according to merely mechanical laws of nature."¹ "Since we do not observe ends in nature as causes working according to purpose, but only add this concept in reflecting on the products of observation as a guide to the judgment, these ends are not given to us from the object."² When Kant, in spite of this clear insight into the purely subjective character of the concept of end, attacks not only the realism but also the idealism of final causes, when he casts aside the assumption that the end is nothing but an idea of our own mind, the main explanation of his course is that this assumption "does not at all explain the illusion in our teleological judgment."³ The unity of mechanism and design, which Kant presupposes, lies in the intelligible ground of nature; teleological and mechanical causality stand over against each other only in our thought, and such are the subjective conditions of our understanding that it is not possible to reduce the former to the latter. Another "understanding higher than man's might find in the very mechanism of nature the ground of the possibility of such products of nature as the organic."⁴ We cannot overlook the fact that by denying the possibility of a mechanical explanation of organic phenomena, Kant has excluded living nature from the realm of scientific knowledge. For unless mechanism is presupposed as "the very foundation of investigation, there can be no real knowledge of nature."⁵ Kant's own dissatisfaction with this result of his critique of the concept of end is shown by numerous passages in his treatise which introduce a degree of uncertainty into his conception, and in so doing clearly show the entire difficulty of the problem for the standpoint of science in Kant's time. Kant does not doubt that, so far as lies in its power, science has the warrant, even the vocation, to explain mechanically all

¹ *Kritik der Urtheilskraft*, Werke IV., p. 277 *seq.* ² *Ibid.* p. 289.

³ *Ibid.* p. 281.

⁴ *Ibid.* p. 297.

⁵ *Ibid.* p. 274.

products of nature, even those that show design most clearly; the limitations of our power in this mode of investigation cannot be given in advance.¹ He declares that it is indeterminate and for ever indeterminable, how much the mechanism of nature does as means toward every final purpose in nature, how far the mechanical mode of explanation will be possible. But when he adds: This much we know definitely, that this mode of explanation, far as we may be able to carry it, is insufficient for things which we have once recognised as ends in nature,² he forgets his own correct remark, that we do not observe ends in nature, but add them in our thought of nature, that the recognition of things as ends in nature is merely subjective.

The idea of descent and development in organic nature which rules biological investigation to-day, did not remain foreign to the mind of Kant. Not merely the idea of a real relationship, of a genealogical system of species as consequence of their origin from a common source—the very causes of development, the fortuitous, *i.e.*, mechanical change of individuals, their variability, and the inheritance of this changed character, lay near to Kant's thought. Only the dogma that species are unchangeable, kept him from following these thoughts farther. "For if one starts with this principle, he cannot know with certainty but that several parts of the form now found in a species may be of purposeless, fortuitous origin; and the principle of teleology, *i.e.*, to judge nothing in an organised being as without purpose, which is preserved in its propagation, must thereby become very untrustworthy in its application."³ Darwin has shown how this principle may remain valid without the assumption of a cause working toward ends, and even how it proves its whole fruitfulness only after the above-mentioned hypothesis has been set aside.

¹ *Kritik der Urtheilskraft*, p. 309.

² *Ibid.* p. 308.

³ *Ibid.* p. 314.

The theory of selection has brought to its conclusion in principle the critique of teleology in natural science which Kant began. It opens a way for the understanding of organic nature, which no longer requires the presupposition of a transcendental principle of purpose. In place of the teleological judgment of organic phenomena, it gives an explanation of them far more satisfactory to the understanding from universal facts accessible to observation. Far as this explanation is from giving mechanical reasons (in the more exact sense of the word) for organic phenomena, there can be no doubt as to its general mechanical character. It arranges the phenomena of adaptation according to the standpoints of a purely scientific method, and forces that "stranger to natural science," the concept of end, from the region of the investigation of external processes. Its mode of expression is indeed still teleological; it seems to be teleological in a higher degree than any previously attempted teleology. Who does not know with what zeal and with what results modern biology has investigated the utility of every characteristic of a living being, however unimportant it may appear; that with perhaps a very few exceptions, there is no part in the organisation of such a being but what has had either some utility for the individual in the battle for existence, or some utility for the predecessors of this individual? But the utility that works creatively need not be felt as utility, or striven for as such. It is not a teleological but a mechanical utility. Apart from the possible and certainly very limited influence on the organisation of activities really aiming at an end or of voluntary actions, it is not at all important that the utility be recognised as such and sought as such, but only that it is a real utility. The principle of the survival of the fittest, that process of passive adaptation which is far more important in nature than active adaptation, explains the ordinarily progressive, rarely retrogressive, development of the organisation of

plants, which is neither felt nor sought, as well as the development of animals. Just those advantageous changes upon which the theory lays most weight are entirely unknown to the individual, and so cannot be consciously sought by him. Those little modifications, scarcely noticeable when they first appear, are the ones which create for the individual an advantage, be it ever so little, in the severe, unremitting struggle for the means of existence. The utility of which this theory treats is simply a result, not an end. Purpose is set aside as a principle for the explanation of organic nature; indeed the way is opened for the explanation of adaptation from objective principles.

I do not consider it a correct or a proper judgment of a theory to measure its value by what it cannot yet explain, instead of using as the standard what it has actually explained. Certainly the facts which the theory of selection lays at the foundation of its explanations: variability, inheritance, struggle for existence, are not simple principles, but exceedingly compound processes. Still they can be observed, their results can be followed out, and in the future it will undoubtedly be possible to analyse them; in fact, a beginning has already been made toward the analysis of inheritance. Moreover, it is too easy to forget that the theory of selection does not attempt to explain the origin of life, but the descent of species, the existence of which presupposes life. And when the statement is added, that up to date the principle of transition from the one-celled being to the organism composed of several cells has not yet been discovered, the limits of present biological investigation have been given; it is not, however, justifiable to treat these as limits for the future progress of the science.

He who holds to what has been accomplished, instead of making demands of the future, understands and shares the feeling of the student of nature when he looks upon the theory of selection as the fact that

breaks the spell which seemed to prevent men from understanding the laws of organic creation.

§ 5. It is less a matter for the critique of knowledge to describe the process actually followed by science, than to develop the reasons for this process. That description, together with the rules depending on it, can be given far more completely by the investigating science itself than by the science of criticism. When natural science sets aside the concept of end as a means of explaining external phenomena, and following the course suggested by these phenomena themselves, seeks to understand them from general mechanical laws of nature, it is guided not only by the conjecture that the only form of explanation accessible to it is the mechanical, but also by the perception that the concept of end is transformed into a transcendent and entirely incomprehensible principle when it is applied to external nature. Means and end are concepts which are not to be separated from relation to a will, without losing all meaning that can be understood. They are abstracted from the form of the activity of will, from the inner perception of conscious purpose. It is impossible to abstract from consciousness and purpose, and yet keep these concepts in mind. A result is only an end when it is anticipated in thought and sought for by the will on the ground of previous experiences. The problem proposed by Dühring, to think the concepts of means and end in abstract purity, *i.e.*, with no relation to conscious purpose, is absolutely insoluble. The very connective: *in order that*, which might be used as the sign for the idea of end in the abstract purity sought, itself expresses only the reversed judgment of cause; it does not denote a relation of purpose except when used with reference to the causality of the will. Between the mechanical causality of external processes and the teleological causality which applies to no processes at all but to voluntary actions, no third is possible, not even an "unconscious." In consequence

of his belief in relations of end, even in a nature that is without sensation, Dühring finds himself obliged to speak of the "unconscious activity of wise forces acting according to law ;" and this is nothing but a description of the "unconscious," which is known only to Hartmann, and is his exclusive property. Instead of speaking of goals and a "tendency toward goals" in physical nature, when the problem is to explain compound effects of a form apparently prescribed, one ought to hold fast the empirical concept that the direction of motions in nature is determined. The direction is given with the motion. Change of direction of a body in motion, like change in its velocity, only occurs under the influence of a second body. It does not depend on the unconscious effort of the body toward a goal lying in the future, but on the presence and nearness of another material mass. To assume that a future order may affect the present arrangement of things and the direction of their motions, in any other way than by thought and will, involves the assumption that nature is a being that sees the future. Design is either due to will, or developed according to the universal laws of matter.

At most, natural science could only approve of teleology as a mode of thought which has reference to the *origin* of things. But inasmuch as it does not occupy itself with the final reasons of things, but rather with the relative beginnings and the development of phenomena, it leaves to metaphysics the question whether existence in general involves design, whether the world taken as a whole is to be thought of as teleological. Philosophical speculation applied to this question would soon convince itself that the concept of end has no just application beyond the limits of voluntary actions and their results. As the ideas of beginning and ending in time are not applicable to the world as a whole, so the concepts of means and end have no application to it. The reason is the same in both cases. Means and end are relative

concepts, as are beginning and ending; in fact, end is nothing but the practical idea of the ending—the final goal. The concept of the whole of things, on the other hand, is not relative, and so cannot come under the point of view of means and end. The concept of end has its origin (for the consciousness of an animal being) in the differences of feeling and the conscious efforts of this being; accordingly it is not susceptible of total integration, or of application to the world as a whole.

Where there is no reason for assuming life and consciousness, there is no reason at all for presupposing ends. But for every living and self-conscious being, its own existence must appear as the final end of existence in general. It must live and seeks to live, its own life necessarily assumes the character of the end in its own consciousness; and since its will does not reach beyond its own existence, its life is necessarily regarded as the end of existence in general. The source of all ideas of end is the conscious effort for self-preservation, and the reason for this effort is the relative independence, the individuality of the animal being as the result of which the consciousness of each one becomes for itself temporarily the central point of existence. If we could put ourselves at the subjective standpoint from which another animal being apprehends its own existence, we should be obliged to share its idea that its own existence, as the final end of this being, is at the same time the final goal of existence in general. Even man is not excepted from this subjective law; for him, too, from the standpoint of self-consciousness, his own existence must appear as the final end of existence in general. He may indeed sacrifice his own individual existence to higher ends which he recognises and strives after, *e.g.*, moral and political ends; but he is only able to do this from the fact that his own effort for self-preservation is projected into these ends in such a way that they become one with his personal existence. If the existence and perfection of

the human race were really an end of the order of nature itself, and not merely, as is very evident, the final end of man, would it not be necessary for men always to have existed and always to continue to exist?

Because every conscious being thereby makes himself the final end, and is obliged to do so, no one of them can be a real final end; the relativity of ends is perfectly evident. In nature every means is at the same time an end, and for this very reason nothing in nature is either means or end.

The concept of end is subordinate to that of causality, because it is the concept of a peculiar kind of causality, namely, the causality of the will. So we are not only warranted but compelled to ask the reason of the end, and in thus asking we find our attention directed to the natural constitution of the being that sets ends before itself. The nature of a being necessarily determines what definite ends it seeks and must seek. If we could investigate far enough the causes of this natural constitution, we finally should reach the elements and universal laws of reality from the combination of which the will and the ends of that being proceed. The universality of law explains the particular kind of obedience to law in the voluntary actions of animal beings, which is represented in their consciousness as design. Where law is inoperative, design is inoperative. The obedience to law includes the obedience to ends; it is therefore the universal form for the apprehension of phenomena in nature. Certain things could not be striven for as ends, and others used as means, unless the purposed result were to follow from the nature of things themselves, according to law, or in subjective language, with necessity. Calculation and prevision of the future, on which purposeful action rests, presuppose that processes are subject to law, that the fundamental attributes of things are unchangeable. So obedience to law introduces obedience to ends by means of the will. The

teleological view of nature rests on the purely causal explanation of nature, because the end arises from the causal order of nature.

As the knowledge of nature has advanced, the teleological view of things has been forced farther and farther back, from the idea of the adaptation of nature to man, to the idea of the inner adaptation of organisms, and finally to the thought of purpose in the origin of things and in the form of the prevalence of law in nature generally. Because man uses things as an acting being, the belief arises in him that things were created to be useful to him. Socrates gave popular expression to this naive teleology in antiquity, and it is not to be denied that even apart from its practicable reasonableness, it concealed a kernel of truth. In this case, as in the question as to the reality of the external world, scientific knowledge is found to be much more in sympathy with the unschooled mind, the view of which it corrects but does not set aside, than with the mind trained in the schools. The natural inclinations of man, his innate impulses and the natural directions of his will, are the product of his natural development; because they have been formed and fixed by adaptation to the present conditions of life in the external world, they bear in themselves a sort of *a priori* guarantee of their truth. If, then, the external world seems to favour the natural ends of man, this agreement is only a result of the fact that those ends, or more correctly the needs lying behind them, were themselves brought into a definite direction by adaptation to the conditions of existence which appear as a means. Here also development is not for the sake of a utility that is recognised and sought after, but it has only taken place through the utility that has preceded it. From this external and relative design is to be distinguished the immanent design of Aristotle, whose views for a long time controlled the science of organic nature, and still continue

in the doctrines of animism and vitalism to-day. Aristotle projected the end into individual things themselves; he even regarded it as the *form* of these things which is to be thought of as at the same time the principle and the goal of their development. Matter is receptive for this form. It has the capacity for form, and strives after it. But the form is regarded as the creative self-forming principle, as the true final cause, which at the beginning of the development is potentially that which it becomes in reality at the conclusion of the process. Accordingly it is the essence *à priori*, the *τί ἢν εἶναι* of individual things. Even Kant's teleology bears a certain relation to this view of Aristotle, in so far as Kant also starts with the adaptation to ends in the inner form of an organic being. Yet the distinction between the teachings of the two philosophers is more important than the agreement. It consists principally in the fact that Kant did not regard the end as the creative principle of the organic form, but only as the subjective principle for judging it. The reason why mechanism and adaptation are not to be derived from a single principle, lies, according to Kant, in the limitation of our understanding, not in the nature of things themselves. If we possessed the capacity of a "full spontaneity of intuition, a capacity for knowledge distinct from sense and entirely independent of it," we should apprehend as necessary that which appears to us fortuitous according to the laws of mere mechanism. Even more, we cannot even "question the fact that another understanding higher than the human could find even in the mechanism of nature the reason for the possibility of such products of nature (as the organic)."¹ In order that the reader may not for a

¹ *Kritik der Urteilskraft*, p. 297. Kant uses the idea of an intuitive understanding, as he expressly says, only that he may make plain the limitation of our discursive understanding, just as he uses the idea of another mode of intuition than the one peculiar to man, only with the purpose to make clear the dependence of phenomena on the form of

moment believe that the understanding of Darwin is really a higher kind of understanding, I at once call attention to the error in Kant's view. Unquestionably we never in any case know the real creative principle of phenomena, because we cannot go behind the sensation with which all experience begins. This limit of knowledge, however, is the same for the field of inorganic phenomena as for the field of organic phenomena. The investigation of the external world everywhere finds one and the same limit, and the mechanism in nature is exactly as conceivable and as inconceivable as any organic product in nature. The incomparably greater complexity of organic phenomena does not justify us in introducing a peculiar principle of knowledge for them, or even, since that is evidently impossible, a peculiar principle for judging them. Organic phenomena are a part of external experience, and so they can only be known according to the general laws of external experience. To set up a peculiar principle for organic nature means nothing less than to assert that organic nature is incomprehensible.

§ 6. What the mind regards as purposeful is merely the prevalence of law in external phenomena, the connection of phenomena according to cause and effect from the point of view of mechanical causality. The mind's goal is the knowledge of things; it does not aim to estimate their value or to judge their meaning for the will. The knowledge of objects is not increased when this meaning is understood; there arises only a new relation of the objects to the subject—the relation to feeling and to will. The homogeneity of knowledge would be destroyed if certain phenomena

intuition (*ibid.* p. 296). He does not assert that this "problematic understanding" really exists or can exist for any being in the world. Schelling, however, delights in the possession of this higher understanding, which he regards as the organ of natural philosophy and even as a sixth sense. No wonder that for the rest of us who lack the power even to understand what such an understanding is, the revelations of Schelling appear so impossible to understand.

in external nature, *e.g.*, the organic, were excepted from the universal laws of external experience. The teleological point of view could not fill the gap which would arise. This point of view is due to an interest of the mind entirely different from its interest in knowledge and science. That which is known as necessary is in many cases at the same time purposeful in its relation to the will; however, it is certainly not the same thing to recognise things as purposeful, and to understand in its origin adaptation to ends. The practical judgment cannot take the place of theoretical knowledge.

If organic phenomena were, as Kant teaches, purposeful for the judgment alone, for this very reason they must be without purpose for the understanding, since this judgment cannot take the place of knowledge for the understanding. The assertion that a teleological principle in the narrower sense of the word is necessary in order to understand organic forms, is, as has been shown, nothing but the confession that the understanding has no power over this field. By the principle that all phenomena are purposeful for the mind, the introduction of a special principle of purpose for organic nature is expressly excluded. It is not at all a question, as Kant thought, about one unity more or less, so that the phenomena of nature would possess a yet higher degree of intellectual adaptation to ends if they were related teleologically; this teleological unity must rather break their connection according to universal laws, and so destroy, or at least limit, their purposefulness for the mind. Kant really recognises this when he proposes an antinomy of the reflecting judgment, which, in fact, does exist for his point of view. This antinomy is not solved by refusing to regard either mechanism or teleology as the mode of activity of things themselves. On the contrary, the contradiction is emphasised most sharply when one carefully keeps within the limits of

the critical view of nature, when one sees in mechanism only the form of the knowledge of nature by the mind. The fact that Kant was really thinking of the causal connection of things in his principle of the teleological unity of things, is a certain inference from his own presentation of this principle. The concepts of the understanding are constitutive only with reference to the formal side of experience in general, because the understanding creates the form of experience according to the rule given by these concepts; they are regulative when they are applied to the particular relations of phenomena. But in order to be able to regard the particular in experience as subject to the concepts of the understanding, we ought to treat it as possessing such a unity as would be given by an understanding.¹ In this sense, according to Kant, the Idea of a highest intelligence as cause in nature is the scheme for the greatest possible use of the understanding in the investigation of nature. To this cause, which we do not know, but only presuppose as the ground of the systematic unity of nature, we only need "to give such attributes as are analogous to the concepts of the understanding in its empirical use."² And in order to leave no doubt as to his meaning, Kant explains that we are not justified in asserting the existence of a being above nature with the attributes in question, but only in putting the Idea of such a being at the foundation of our investigation of nature, "in order to regard the phenomena as systematically connected together according to the analogy of causal determination."³ We are obliged, we read in an earlier passage, to make the systematic unity of nature entirely universal in relation to the Idea of a highest intelligence. "For then we regard as fundamental an adaptation to ends in accordance with universal laws of nature, from which no single

¹ *Kritik der Urtheilskraft*, p. 18.

² *Kritik d. rein. Vernunft*, p. 525.

³ *Ibid.* p. 541.

arrangement in nature is excepted; and we have as a regulative principle the systematic unity of a teleological connection. We do not determine this in advance; we can only follow the physico-mechanical connection according to universal laws in expectation of the teleological connection."¹ The connection in question is not teleological in the narrower sense, but causal, physico-mechanical, and for this very reason it is a connection that suggests purpose to the understanding.

It seems almost superfluous to criticise the Idea of a highest intelligence in order to determine its peculiar value for the systematic knowledge of nature. In order to objectify, as it were, the systematic element in our view of things, and the absolute prevalence of law extending even to each individual process, which we presuppose to complete our experiences, it is not sufficient to assume mind as the originator of things. We are obliged, and this does not escape Kant's attention, to add the farther assumption, that this mind works in a way we can understand; and if we do not add this assumption, the first presupposition is of no use, and the thought which it expresses symbolically is simply the postulate that phenomena are conceivable; in other words, it simply expresses our purpose to know.

In order that phenomena may be conceivable, we must first make them conceivable by arranging them according to the point of view of logical thinking, and by going back to the uniform and persistent in them. To this extent mind is to be regarded as the originator of the conceivability of phenomena. But since we are guided in this analysis by the nature of things, the final ground of the conceivability of nature is to be sought in the given relations of phenomena, in the coincidence of these relations with the formal activity

¹ *Kritik der Urteilskraft*, p. 535.

of thought. Mind is not *a priori* in its origin, it does not precede things in themselves; it is the condition of the knowledge of things, and is *a priori* only in reference to its product—the universal form of experience. Persistence in the attributes of things as they appear, uniformity in the succession of their states under like circumstances, in brief the empirical prevalence of law among objects, is not the result of our mind's activity, but rather the reason why we have mind. We cannot form the least conception of a mind that creates the organs of consciousness in an animal being; it is before our very eyes to see that these organs are developed according to the universal laws of nature. But it is possible to understand in a general way that the brain of an animal acquires its power to know under the influence of external phenomena upon its functions. The difference of phenomena forms the power to distinguish differences, the similar in them, the power of comparison and connection; and although it is only the unity essential to the knowing consciousness that makes possible distinction or connection, still we see this very function of unifying associated with an organic individuality, and connected with the processes of life.

§ 7. The causes of the mechanical connection of things are unknown so far as their constitution is concerned; we can only conceive the form of this connection. On the other hand, the connection of means and end seems to us perfectly comprehensible, and so it really is, so far as it is brought about by our own will. This, however, presupposes the existence of will, as well as the nature of things which it uses as means. There can be no reasonable doubt as to the final end which every animal being, not excepting man, must set before itself. Such a being strives in its own way to secure a state of satisfaction for its consciousness. As Feuerbach has said, will and the effort for

happiness, or more exactly effort to satisfy consciousness, are one and the same thing. Only the satisfaction of our consciousness does not lie so much in the satisfaction we receive, as in the satisfaction we prepare for ourselves and for others by setting our powers in activity. The statement that the greatest possible satisfaction of our consciousness is the final goal of our effort and our action is the axiom of practical philosophy, and is as self-evident as any axiom of geometry. Every effort to attack this proposition amounts in the end to this: the removal of this final goal of our action from our immediate vision, in order to set it up again in another world. The axiom in question may be called the principle of development in the moral world, since, in fact, all increase of spiritual life begins with the realisation of this principle. But acquaintance with the means fitted for the attainment of the practical goal is only to be obtained by a psychological study of human nature and history in connection with investigation of the external conditions of human life, and so it is difficult to acquire. Socrates spent his life in meditation about the right and correct form of action in each particular case.

We can understand the nature of teleological causality, since the connection of means and end falls within inner experience, within self-consciousness; it even forms an essential part of self-consciousness, for we are never more clearly conscious of ourselves than when we are acting. We know mechanical causality so far as its form is concerned. It belongs to our consciousness of other things, the nature of which we experience only in our sensations of them. It is evident that the main reason for this antithesis is the difference in our points of view. Still this does not justify the conclusion that teleological causality includes insight into the general nature of the causal connection. This metaphysical hypothesis is refuted by the very origin of the causality of the will. Voluntary action, which alone seems to

self-consciousness to be original, follows in the development of the individual reflex and automatic motion. It is mediated by the idea, and accordingly it presupposes previous perceptions from which the idea originates.

The effect of the future on the present in and through the relation of means and end is only an illusion. What is not yet real cannot produce an effect. Activity at a distance in time, an effect of the future on the present, is unthinkable, while action at a distance in space is only inconceivable. The cause of effort and will is not the future but the past result. The will starts with the present feeling of a want which, as the result of previous experiences, wakens in memory the idea of the result (*i.e.*, the satisfaction of the want) and the means by which this may be obtained. Actions which are occasioned by the active feeling of a want, by the effort to set aside a state of discomfort, with no empirical knowledge of the result, and no inference from the combination of previous experiences (*e.g.*, earliest expressions of the sexual impulse), are to this extent not voluntary actions, and so not determined by purpose. Purposeless actions by the animal being precede purposeful, and those of their number are most deeply impressed on consciousness which have fortuitously led to a result suggesting purpose, a useful result. There is a selection among possible movements, fixing such as are useful. The ideas of such movements as are fitted to satisfy want are constantly more and more closely associated with the feeling of a need. Farther, the memory of the satisfaction reached is connected with these ideas. As often as the feeling of the want is wakened anew, it brings with itself the ideas of certain actions and their satisfying results; and since the idea of a movement is a cause, a stimulus to the movement, the feeling only needs to be strengthened by the longer or shorter delay of satisfaction, and consequently the intensification of the stimulus to movement, in order

to cause the latter to take place. Every new result strengthens the connection between the feeling and the definite movement, until the transition from the idea of the movement to the execution of the same follows with the certainty of an acquired adaptation. If the feeling had been followed originally by more or less unorganised movements of which only particular ones satisfied the consciousness of the unrest and pain of want, in the progress of experience these movements must become constantly better organised and better adapted to produce the result sought. The execution of a particular movement becomes the object of an effort, the direction of which is thereby determined, and which is interposed between feeling and movement; and as a consequence of the increasing power of the images of memory, it assumes more and more distinctly the character of a purposed effort, it becomes at length an act of will. Meynert asserts, and from the standpoint of the physiologist I believe he is correct, that a class of movements exists which properly belongs between reflex movements and conscious acts of the will.¹ The psychologist, however, cannot give up the concept of impulse. That which is known to inner experience as impulse is not a motion, nor the effort toward a definite movement which would be foreshadowed in the impulse, but it is the feeling of want itself. Psychologically considered, the so-called impulse toward food simply coincides with the feeling of hunger; the so-called impulse of sex, with the feelings which characterise the age of puberty. In a word, the impulse is nothing distinct from the active feeling. In the feeling of hunger in the new-born child there is, of course, absolutely nothing which could teach the child the means of relieving its painful want. But the impulsive character of the feeling is expressed in the general state of movement and unrest which results from

¹ Th. Meynert, *Psychiatrie*, I. Hälfte, Wien, 1884, p. 157.

it, and increases as it continues. In the case of a new-born human being we find only a few instinctive movements, *i.e.*, co-ordinated movement-reflexes set in motion by a particular sensation; but we find these movements far more numerous in the case of animals. There can be no doubt as to the existence of definitely directed movements of an impulsive character which are stimulated by a feeling. It is still possible, however, to deduce the instincts, in so far as they have not been developed by selection, from actions originally voluntary on the part of the ancestors of the animals living to-day, on the supposition that the inheritance of acquired characteristics can be granted at all; and Meynert would be right in questioning the originality of a third order of animal movements between reflexes and acts of the will.

An animal knows nothing of the future, accordingly its acts cannot be determined by the idea of a future result as such; it is either impelled to them by the feeling of a present discomfort, or by the memory-image of past pleasure which is awakened by a present perception. Man knows of the future, and can strive toward it; but his ideas of a future result must also depend on past experiences, and in his case also the ground determining action is a present feeling. Prevision is memory projected into the future. If the expectation of finding present again what was once present, is connected with the will to *make* present again that which is expected, it becomes the end of action directed toward it as a goal. The schema of teleological causality is everywhere the same; with the feeling of a want is connected the idea of an act which leads to the satisfaction of the want, and this idea arises out of past experience.

This ought not to cast doubt on the fact that the human mind is in a certain sense able to anticipate the future. Every scientific discovery which gives occasion

to new experiences, and equally every creative act of the will which sets up a new rule of action, give the proof of this. Who does not know that scientific ideas first appear in the form of hypotheses, which must afterward find their confirmation in experience. But if these cases of prevision of that which is later found to be true and real, were more exactly investigated, the elements of such knowledge *à priori* might still always be found in previous experience. These elements only enter into a new fruitful combination in the mind of the scientific discoverer, and this combination follows so involuntarily that the result of it is wont to be regarded as happy chance and called divination. The more exact process of the creation of scientific and practical Ideas is indeed veiled in darkness; but the reason for the possibility of this creation is at least not wholly unknown to us. We know that the separation of intellectual from emotional functions in the mind of man is carried to the greatest degree, so that the current of ideas must win a certain independence, not to say automatism. Our brain is constantly occupied with the images of past experiences, which through the cerebral processes enter into combination with present impressions; this product alone comes into consciousness. Accordingly such a result of unconscious cerebration stands before our mind as a gift of which we do not know the origin. There is no other prevision of the future except that which mediately or immediately proceeds from the experiences of the past. The past rules the future through understanding and will. The end to be realised is no secret, as must be the case if the future as such is really to exert influence on the present by means of it. It is no *vis a fronte*, not a cause which would be at the same time its own effect.

§ 8. With the first voluntary act of an animal being ends come into existence, and the sphere of their ac'

vity is constantly increased in like degree with the development of consciousness. Man is pre-eminently the being in nature who sets for himself ends of action. He alone has in the course of his mental development risen to the Idea of progress; he alone has apprehended as a duty the increase and perfecting of his own faculties, the furthering of his personal and social life. He reacts on the outer world with the inner forces of his thought and his will. He compels things, while following their own laws which he has ascertained, to take the course which his mind prescribes for them. So the motions of external things within the sphere of his activity are directed according to the little motions in his brain. Man is not merely a product of the process of nature, but at the same time an independent part of nature. In thinking and in acting he sets himself over against external nature, he distinguishes himself from things which he makes subject to his own ends. Just because his action belongs to the general order of nature, the future of things is in part determined by his acts. Man does not take an exceptional position in this way; he has only gained a privileged position, which he must constantly assert by the power of his mind and the effort of his will, in order not to lose it. If he is an independent part of nature, a cause and not merely an effect, so also every other thing, every element of a thing, is an independent part of reality, provided with the power to produce results. This is the practical power of the *ego*, as Fichte calls the spontaneity in things, and which he with the one-sidedness of the metaphysician found in the will and the thought of man alone; as if man had a privilege to be and to do, which other things had not. The mechanism of external things ought not to lead men into the false belief that things lack this moment of independence. Effects in nature are not produced by mechanism; they take place in accordance with the external mechanism. Of course, there should

be no thought of absolute spontaneity; every activity is reaction. But there could not be anything *à priori* in our minds, there could not be any initiative in thinking, or even an appearance of independence in the subject, if there were nothing original and active in the things themselves.

The purposeful actions of an animal being must at least react on its own individual organisation. The end not only expresses the essential character of voluntary actions for the consciousness of the acting being, it has not only subjective reality; since acts of the will are at the same time physiological processes, it acquires objective meaning also.

There is an interaction between functions and their organs which Roux, who has investigated this relation most carefully, calls functional adaptation.¹ "Coming into play more and more frequently, the function gains more and more control over the functioning substratum by means of functional adaptation." The function is a nutritive and a formative stimulus for the organ; it exercises upon each smallest part of it an effect stimulating assimilation, and in degree corresponding to the frequency of its repetition it produces a size, form, and structure of the organ such as is best adapted to the functional relations, until the organ is so completely adapted to the mode of the function that it possesses only the functional form. The functional stimulus by means of the function itself produces perfection in the finest molecular relations of the organ. So as the result of the nutritive and formative stimuli of the function, the bony parts of the spongy substance arrange themselves according to a system of curves which exactly corresponds to the lines of pressure and

¹ W. Roux, *Der Kampf der Theile im Organismus*, Leipzig, 1881; Engelmann und Roux, *Beiträge zur Entwicklungsmechanik des Embryo*; S. A., aus der Zeitschrift für Biologie, München, 1885, p. 77 ff.; cf. also Du-Bois Reymond, *Ueber die Uebung*, Berlin, 1881.

tension of graphic statics. We infer from this that the arrangement of the ganglia cells becomes a fixed and purposeful arrangement under the formative influence of purposeful acts repeatedly taking place in the same manner, a process which we call the habit of the central organs.¹ If we assume farther the inheritance of such modifications of the central organs, which take place in the same direction persistently and through many generations, the end sought must itself assume a phylogenetic meaning. In the innate co-ordinated reflexes we might, according to this view, see embedded in the organism (at least in part) the results of co-ordinations originally voluntary; possibly the innate mechanism of innervation in the eye-muscles is really an example of such inheritance. But the inheritance of acquired faculties has recently become, to say the least, exceedingly doubtful, and it can hardly be denied that selection, roundabout as its methods may be, can reach the same goal as inheritance.² However that may be, the reacting co-ordinating influence of purposeful actions upon the individual organism is put beyond question by the fact of functional adaptation.

This influence of a psychical function upon physical organisation, it is true, can only be made clear to our understanding when we start with the assumption that the substratum of physical and psychical processes is one and the same. If the substratum of these two classes of phenomena is identical, purposeful actions can and must react upon the bodily organisation. Since purposeful actions do react upon the organisation of the body, the substratum of physical and spiritual nature must be one and the same. In order to explain this

¹ This passage, written in 1887, may now claim the support of that eminent investigator, R. y Cajal. See the report of his Croonian Lecture in *Nature*, March 15, 1894, p. 466.

² On this whole question compare Weismann's *Essays* (English translation, Oxford, 1890), and in particular his latest work, *Die Allmacht der Naturzüchtung*, Jena, 1893.

effect, we keep exclusively to the physiological side of the act of will. If we possessed complete knowledge of the mechanism of external nature, we might abstract entirely from purpose and will. The statement that there is only one principle for the explanation of external processes of nature, the principle of mechanical causality, remains true.

Purpose is objectively real, because purposeful action is a process which by virtue of the unity of the substratum of material and spiritual phenomena is part of the context of external experience. Voluntary action is the subjective expression of the same activity which is objectively represented as spontaneity of the cerebrum. Animals deprived of the cerebrum continue to move, but they do not act; according to Goltz, none of the movements which are made by an animal thus operated upon show that it still possesses what we call conscious deliberation.—Purpose is no principle for explaining processes in external nature, even if this process is a purposeful action, *i.e.*, an act of the will, by an animal being.

§ 9. In the sphere of the practical, and here alone, has purpose its right place. Here it is no longer a principle for judging the form of an object; it is the principle for the creation of objects themselves, for the objects which here come into consideration are voluntary actions as such. And as voluntary actions arise from the consciousness of end and from motive, they are to be explained from end and motive. The explanation of them only repeats the process of their genesis; it is completely identical with this. He who attempts to prove the end as imaginary in this sphere must explain his own will as imagination. Because distinctions of value in phenomena exist for feeling and the will, there are ends of voluntary action. It was an error of Spinoza's to regard necessity as absolutely real, while the conception of end is merely a mode of thought. This should rather be reversed; necessity is a mode of

thought peculiar to our mind. The process of the metaphysical thinker is not only fortuitous but even inconsequent. The reason alleged by Spinoza for his assertion that the end is imaginary, applies also to necessity, with the necessary change in expression. True as it is that the end cannot be separated from the desire of man, it is equally true that necessity cannot be separated from man's thinking. It has no place outside the thought that seeks reasons. Spinoza's statement about the concepts good and bad—that they mean nothing positive in the things themselves, that they arise from the comparison of things with each other and in relation to the will of man—must also be applied to the concept of necessity. Necessity also is nothing positive in things themselves, and its concept also arises from the comparison of things with each other and in relation to man's thinking. All necessity is relative to a reason, and the reason is relative to the understanding which uses something as reason in the connection of thought. The understanding is the originator of necessity, as the will is the originator of purpose. Reason and consequence, which form the concept of necessary connection, are categories of the understanding, as end and means are categories of the will. Necessity and purpose are not to be distinguished by the fact that the one concept is objective, the other subjective. Both concepts are alike subjective in their origin; but while necessity acquires objective meaning mediately through the persistence and uniformity of objects in experience, purpose is made real immediately by the will. Nature, Spinoza says, does not act with a purpose in view. But does it follow from this that a self-conscious being, that man does not act, or is not under obligation to act, with a purpose in view? And does not man belong to nature?

Necessity is the principle of theoretical apprehension ;

purpose the principle of the practical judgment and the formation of things. The question, What is and what happens, expresses the desire to experience facts and reasons; the question, What ought to happen, seeks to know the ends which I can set before myself as fitted for a reasonable will to strive after. The theoretical and the practical apprehension of nature can never contradict each other, because the very statement of the question with which they start is different.

In the psychical history of mankind the end is immediately real. History is ruled by Ideas, *i.e.*, by directions of feeling and forms of belief—faith meaning not merely religious faith, but also political, social, ethical faith. These Ideas, which determine the course of historical events, must be known if the events themselves are to be understood. It is incorrect to say that the understanding is satisfied only by proving mechanical causality. In this assertion the one-sidedness of the investigation of external nature comes to light, the effort of such investigation to put itself in the place of knowledge in general. The knowledge of the ends and the motives which govern action satisfies the need of the mind for explanation, not less than the pursuit of the threads of mechanical causality. Granted that natural science were complete, that it possessed the knowledge of the processes of motion in nature, it could not take the place of the science of the psychical products of man.

This antithesis between the sciences of nature and the sciences of mind does not introduce any dualism into nature itself; it only assigns the true place to the dualism in phenomena and in the methods of investigating phenomena. The mathematico-mechanical analysis on the one side corresponds to the teleological explanation on the other. Where the end is creative, as in the realm of man and of human culture, there it is the principle of explanation. It is no anthropomorphism to deduce from man and the power of his self-conscious personality this principal

factor of all psychical development, that which originates in man and his power of deliberation.

§ 10. The total view of things corresponds to the fundamental directions of our mind, and is controlled by the Ideas of mechanical causality, of æsthetic proportion and of ethical purpose. The prevalence of law among phenomena makes it possible to know them by the understanding; the proportion and harmony of their form determines their value for feeling; the agreement of their arrangement with the ends proposed by will assures to it the realisation of its ends. But because understanding, æsthetic sense, and will are connected in us into the unity of the person, we feel the need of positing an equally perfect unity in reality outside ourselves. Religious views of the world on the one hand, and metaphysical on the other, seek to satisfy this subjective effort for unity on the part of the mind. The peculiarity of these views and that which distinguishes them from science lies in this interweaving of these Ideas. Even science is not proof against this more than systematic, this personal interest of the mind. The effort of science is constantly directed against this confusion of the spheres of psychical life, and it seeks to prevent the principal currents of this life from crossing each other instead of coming into harmony. One cannot believe on ethical grounds what science declares to be false.

Science does not deny the existence of spirit; it is itself created by spirit. It is not materialistic; it takes a critical attitude toward the objectified concepts of matter and motion. But why should it fall into the opposite error, and presuppose the existence and activity of spirit where there is no basis in experience for such a presupposition?

Development in nature, so far as can be determined from experience, did not start originally with psychical existence; it has reached psychical life as its goal. The inner activity of what we perceive as matter, the

qualitative reality of things which appear to the external senses as motion, has risen to feeling and sensation, the elements of consciousness, and with this has begun a course of development which has continued unbroken up to man, and has introduced the history of his psychical development. The presentation of the principles of this history of psychical life does not, however, fall within the realm of natural science, nor in the realm of theoretical philosophy.

THE END.



A LIST OF
KEGAN PAUL, TRENCH, TRÜBNER, & CO.'S
PUBLICATIONS.

SIZES OF BOOKS.

A book is folio (fol.); quarto (4to.); octavo (8vo.); twelve mo (12mo.); sixteen mo (16mo.); eighteen mo (18mo.); thirty-two mo (32mo.), &c., according to the number of leaves or foldings of a printed sheet, whether the sheet be foolscap, crown, demy, medium, royal, super-royal, or imperial, and irrespective of the thickness of the volume. The following are *approximate* outside measurements in inches of the more common sizes.

	<i>height</i>	<i>breadth</i>		<i>height</i>	<i>breadth</i>
32mo. = royal 32mo.	$5\frac{1}{4}$	$\times 3\frac{3}{4}$	P-8vo. = post 8vo.	8	$\times 5\frac{1}{4}$
16mo. = demy 16mo.	$5\frac{1}{2}$	$\times 4\frac{1}{2}$	LP-8vo. = large post 8vo. ...	$8\frac{1}{2}$	$\times 6$
18mo. = royal 18mo.	6	$\times 4\frac{1}{4}$	8vo. = demy 8vo.	9	$\times 6$
fcy. = fcy. 8vo.	$6\frac{3}{4}$	$\times 4\frac{1}{2}$	M-8vo. = medium 8vo.	$9\frac{1}{2}$	$\times 6$
cr. = {	demy 12mo.	$7\frac{1}{4} \times 4\frac{1}{2}$	SR-8vo. = super-royal 8vo. ...	10	$\times 6\frac{1}{2}$
	small crown 8vo.	$7\frac{1}{4} \times 5$	IMP-8vo. = imperial 8vo.	12	$\times 8\frac{1}{2}$
	crown 8vo.	$7\frac{1}{2} \times 5\frac{1}{4}$			
	large crown 8vo.	$8\frac{1}{4} \times 5\frac{1}{2}$			

Printed and folded in the reverse way—the breadth being greater than the height—the size is described as “oblong” 8vo., “oblong” 4to. &c.

Paternoster House,
Charing Cross Road,
September 1895.

A LIST OF
KEGAN PAUL, TRENCH, TRÜBNER, & CO.'S
PUBLICATIONS.

NOTE.—Books are arranged in alphabetical order under the names or pseudonyms of author, translator, or editor. Biographies 'by the author of' are placed under the name of the subject. Anonymous works and 'selections' will be found under the first word of the title. The letters I.S.S. denote that the work forms a volume of the *International Scientific Series*.

- A. K. H. B., *From a Quiet Place*: some Discourses. Cr. 8vo. 5s.
- ABEL, CARL, *Linguistic Essays*. Post 8vo. 9s. (*Trübner's Oriental Series*.)
Slavic and Latin: Lectures on Comparative Lexicography. Post 8vo. 5s.
- ABERCROMBY, Hon. RALPH, *Weather*: a popular Exposition of the Nature of Weather Changes from day to day. With 96 Figures. Second Edition. Cr. 8vo. 5s. (I.S.S.)
- ABRAHAMS, L. B., *Manual of Scripture History for Jewish Schools and Families*. With Map. Eleventh Edition. Cr. 8vo. 1s. 6d.
- ADAMS, Mrs. LEITH, *The Old Pastures*. Cr. 8vo. 6s.
- ÆSCHYLUS. *The Seven Plays in English Verse*. Translated by Prof. LEWIS CAMPBELL. Cr. 8vo. 7s. 6d.
- AGNES, SISTER MARY, *Thoughts in Verse*. Cr. 8vo. 3s. 6d.
- AHLWARDT, W., *The Divans of the Six Ancient Arabic Poets—Ennâbîga, 'Antara, Tharafa, Zubair, 'Alquama, and Imru'ulquais*. With a complete list of the various readings of the text. 8vo. 12s.
- AHN, F., *Grammar of the Dutch Language*. Fifth Edition, revised and enlarged. 12mo. 3s. 6d.
Grammar of the German Language. New Edition. Cr. 8vo. 3s. 6d.
Method of Learning German. 12mo. 3s. Key, 8d.
Manual of German Conversation; or, *Vade Mecum for English Travellers*. Second Edition. 12mo. 1s. 6d.
Method of Learning French. First and Second Courses. 12mo. 3s.; separately, 1s. 6d. each.
Method of Learning French. Third Course. 12mo. 1s. 6d.
Method of Learning Italian. 12mo. 3s. 6d.
Latin Grammar for Beginners. Thirteenth Edition. Cr. 8vo. 3s.
- AINSWORTH, W. F., *Personal Narrative of the Euphrates Expedition*. With Map. 2 vols. Demy 8vo. 30s.
- Albanaise Grammaire, à l'usage de ceux qui désirent apprendre cette langue sans l'aide d'un maître. Par P. W. Cr. 8vo. 7s. 6d.

- ALBERUNI'S India**: an Account of the Religion, Philosophy, Literature, Geography, Chronology, Astronomy, Customs, Laws, and Astrology of India, about A.D. 1030. Arabic text, edited by Prof. E. SACHAU. 4to. £3. 3s.
- ALEXANDER, Major-Gen. G. G., Confucius, the Great Teacher.** Cr. 8vo. 6s.
- ALEXANDER, S., Moral Order and Progress**: an Analysis of Ethical Conceptions. Second Edition. Post 8vo. 14s. (*Philosophical Library.*)
- ALEXANDER, WILLIAM, D.D., Bishop of Derry, St. Augustine's Holiday, and other Poems.** Cr. 8vo. 6s.
- The Great Question, and other Sermons.** Cr. 8vo. 6s.
- ALEXANDROW, A., Complete English-Russian and Russian-English Dictionary.** 2 vols. 8vo. £2.
- ALLEN, C. F. ROMILLY, Book of Chinese Poetry.** Being the collection of Ballads, Sagas, Hymns, and other Pieces known as the Shih Ching, metrically translated. 8vo. 16s.
- ALLEN, C. L., Bulbs and Tuberous-rooted Plants.** 8vo. 10s.
- ALLEN, GRANT, The Colour-Sense**: its Origin and Development. An Essay in Comparative Psychology. Second Edition. Post 8vo. 10s. 6d. (*Philosophical Library.*)
- ALLEN, MARY L., Luncheon Dishes**; comprising Menus in French and English, as well as Suggestions for Arrangement and Decoration of Table. Fcp. 8vo. cloth, 1s. 6d.; paper covers, 1s.
- Five-o'clock Tea.** Containing Receipts for Cakes, Savoury Sandwiches, &c. Eleventh Thousand. Fcp. 8vo. 1s. 6d.; paper covers, 1s.
- ALLIBONE, S. A., Dictionary of English Literature and British and American Authors, from the Earliest Accounts to the Latter Half of the 19th Century.** 3 vols. Roy. 8vo. £5. 8s. SUPPLEMENT, 2 vols. roy. 8vo. (1891), £3. 3s.
- ALTHAUS, JULIUS, The Spas of Europe.** 8vo. 7s. 6s.
- AMOS, Professor Sheldon, History and Principles of the Civil Law of Rome**: an Aid to the Study of Scientific and Comparative Jurisprudence. 8vo. 16s.
- Science of Law.** Seventh Edition. Cr. 8vo. 5s. (*J.S.S.*)
- Science of Politics.** Third Edition. Cr. 8vo. 5s. (*J.S.S.*)
- ANDERSON, J., English Intercourse with Siam in the Seventeenth Century.** Post 8vo. 15s. (*Trübner's Oriental Series.*)
- ANDERSON, ROBERT, A Doubter's Doubt about Science and Religion.** Second Edition. Cr. 8vo. 3s. 6d.
- ANDERSON, WILLIAM, Practical Mercantile Correspondence**: a Collection of Modern Letters of Business, with Notes. Thirtieth Edition, revised. Cr. 8vo. 3s. 6d.
- ANTHON, C. HERMAN, A Tragedy in Four Acts.** Small cr. 8vo. 3s. 6d.
- APEL, H., Prose Specimens for Translation into German.** With copious Vocabularies and Explanations. Cr. 8vo. 4s. 6d.
- APPLETON, J. H., and SAYCE, A. H., Dr. Appleton: his Life and Literary Relics.** Post 8vo. 10s. 6d. (*Philosophical Library.*)
- ARBUTHNOT, Sir A. J., Major-Gen. Sir Thomas Munro: a Memoir.** Cr. 8vo. 3s. 6d.
- ARCHER, WILLIAM, William Charles Macready.** Cr. 8vo. 2s. 6d. (*Eminent Actors.*)
- ARDEN, A. H., Progressive Grammar of Common Tamil.** 5s.
- ARISTOTLE, The Nicomachean Ethics.** Translated by F. H. PETERS. Third Edition. Cr. 8vo. 6s.

ARNOLD, Sir EDWIN, Grammar of the Turkish Language. With Dialogues and Vocabulary. Post 8vo. 2s. 6d.

Death—and Afterwards. Reprinted from the *Fortnightly Review* of August 1885, with a Supplement. Eleventh Edition. Cr. 8vo. cloth, 1s. 6d.; paper covers, 1s.

In My Lady's Praise: Poems Old and New, written to the honour of Fanny, Lady Arnold. Fourth Edition. Imperial 16mo. parchment, 3s. 6d.

India Revisited. With 32 Full-page Illustrations. Second Edition. Cr. 8vo. 6s.

Indian Idylls. From the Sanskrit of the Mahābhārata. Second Edition. Cr. 8vo. 6s.

Indian Poetry. Containing 'The Indian Song of Songs' from the Sanskrit, two books from 'The Iliad of India,' and other Oriental Poems. Sixth Edition. 6s. (*Trübner's Oriental Series.*)

Lotus and Jewel. Containing 'In an Indian Temple,' 'A Casket of Gems,' 'A Queen's Revenge,' with other Poems. Third Edition. Cr. 8vo. 6s.

Pearls of the Faith, or Islam's Rosary. Being the Ninety-Nine Beautiful Names of Allah. Sixth Edition. Cr. 8vo. 6s.

Poems, National and Non-Oriental, with some new Pieces. Second Edition. Cr. 8vo. 6s.

The Light of Asia, or The Great Renunciation. Being the Life and Teaching of Gautama. Presentation Edition. With Illustrations and Portrait. Sm. 4to. 21s. Library Edition, cr. 8vo. 6s. Elzevir Edition, 6s. Cheap Edition (*Lotus Series*), cloth or half-parchment, 3s. 6d.

The Secret of Death: being a Version of the Katha Upanishad, from the Sanskrit. Fifth Edition. Cr. 8vo. 6s.

The Song Celestial, or Bhagavad-Gītā, from the Sanskrit. Fifth Edition. Cr. 8vo. 5s.

With Sa'di in the Garden, or The Book of Love: being the 'Ishk,' or third chapter of the 'Bostān' of the Persian poet Sa'di, embodied in a Dialogue. Fourth Edition. Cr. 8vo. 6s.

Poetical Works. Uniform Edition, comprising—The Light of Asia, Lotus and Jewel, Indian Poetry, Pearls of the Faith, Indian Idylls, The Secret of Death, The Song Celestial, With Sa'di in the Garden. 8 vols. Cr. 8vo. 48s.

ARNOLD, THOMAS, and SCANNELL, T. B., Catholic Dictionary. An account of the Doctrine, Discipline, Rites, Ceremonies, &c., of the Catholic Church. Fourth Edition, revised and enlarged. 8vo. 21s.

ASTON, W. G., Grammar of the Japanese Spoken Language. Fourth Edition. Cr. 8vo. 12s.

Grammar of the Japanese Written Language. Second Edition. 8vo. 28s.

AUBERTIN, J. J., A Flight to Mexico. With 7 Full-page Illustrations and a Railway Map. Cr. 8vo. 7s. 6d.

Six Months in Cape Colony and Natal. With Illustrations and Map. Cr. 8vo. 6s.

A Fight with Distances. With Illustrations and Maps. Cr. 8vo. 7s. 6d.

Wanderings and Wonderings. With Portrait, Map, and 7 Illustrations. Cr. 8vo. 8s. 6d.

By Order of the Sun to Chili. With Illustrations. Cr. 8vo. 5s.

AUSTRALIA—The Year-Book of Australia for 1895. Published under the auspices of the Governments of the Australian Colonies. Demy 8vo. with Maps. Boards, 10s. 6d. net.

AVELING, F. W., The Classic Birthday Book. 8vo. cloth, 8s. 6d.; paste grain, 15s.; tree call, 21s.

- AXON, W. E. A., The Mechanic's Friend.** A Collection of Receipts and Practical Suggestions relating to Aquaria, Bronzing, Cements, Drawing, Dyes, Electricity, Gilding, Glass-working, &c. Numerous Woodcuts. Second Edition. Cr. 8vo. 3s. 6d.
- BADER, CHARLES, Natural and Morbid Changes of the Human Eye, and their Treatment.** 8vo. 16s. Atlas of Plates, in portfolio. Medium 8vo. 21s. Text and Atlas together, £1. 12s.
- BAGEHOT, WALTER, The English Constitution.** Seventh Edition. Cr. 8vo. 7s. 6d. Lombard Street. A Description of the Money Market. Tenth Edition. With Notes, bringing the work up to the present time, by E. JOHNSTONE. Cr. 8vo. 7s. 6d.
- Essays on Parliamentary Reform.** Cr. 8vo. 5s.
- Physics and Politics;** or, Thoughts on the Application of the Principles of 'Natural Selection' and 'Inheritance' to Political Society. Ninth Edition. Cr. 8vo. 5s. (*J.S.S.*)
- BAGOT, ALAN, Accidents in Mines: their Causes and Prevention.** Cr. 8vo. 6s. Principles of Colliery Ventilation. Second Edition, greatly enlarged. Cr. 8vo. 5s.
- Principles of Civil Engineering as applied to Agriculture and Estate Management.** Cr. 8vo. 7s. 6d.
- BAGSHAW, JOHN B., Skeleton Sermons for the Sundays and Holidays in the Year.** Cr. 8vo. 3s. 6d.
- BAIN, ALEX., Education as a Science.** Seventh Edition. Cr. 8vo. 5s. (*J.S.S.*)
- Mind and Body.** The Theories of their Relation. With 4 Illustrations. Eighth Edition. Cr. 8vo. 5s. (*J.S.S.*)
- BAIN, R. NISBET, Weird Tales from the Northern Seas.** From the Danish of JONAS LIE. With Illustrations by LAURENCE HOUSMAN. Large post 8vo. 7s. 6d.
- Gustavus 3rd and His Contemporaries, 1746-1792;** from original documents. 2 vols. post 8vo. 21s. net.
- BAKER, Major EDEN, R.A., Preliminary Tactics.** An Introduction to the Study of War. For the use of Junior Officers. Cr. 8vo. 6s.
- BAKER, IRA, Treatise on Masonry Construction.** Royal 8vo. 21s.
- BAKER, Sir SHERSTON, Bart., Laws relating to Quarantine.** Cr. 8vo. 12s. 6d. Halleck's International Law. Third Edition, thoroughly revised by Sir SHERSTON BAKER, Bart. 2 vols. Demy 8vo. 38s.
- BALDWIN, Capt. J. H., Large and Small Game of Bengal and the North-Western Provinces of India.** With 20 Illustrations. Sm. 4to. 10s. 6d.
- BALFOUR, F. H., Leaves from my Chinese Scrap-Book.** Post 8vo. 7s. 6d.
- BALKWILL, F. H., The Testimony of the Teeth to Man's Place in Nature.** With Illustrations. Cr. 8vo. 6s.
- BALL, JOHN, Notes of a Naturalist in South America.** With Map. Cr. 8vo. 8s. 6d.
- BALL, Sir ROBERT, The Cause of an Ice Age.** Cr. 8vo. 2s. 6d. (*Modern Science Series.*)
- BALL, V., Diamonds, Coal, and Gold of India: their Mode of Occurrence and Distribution.** Fcp. 8vo. 5s.
- BALLANTYNE, J. R., Elements of Hindi and Braj Bhakha Grammar.** Compiled for the East India College at Haileybury. Second Edition. Cr. 8vo. 5s.
- First Lessons in Sanskrit Grammar.** Fifth Edition. 8vo. 3s. 6d.
- Sankhya Aphorisms of Kapila.** With Illustrative Extracts from the Commentaries. Third Edition. Post 8vo. 16s. (*Trübner's Oriental Series.*)

- BALLIN, ADA S. and F. L., Hebrew Grammar.** With Exercises selected from the Bible. Cr. 8vo. 7s. 6d.
- BANCROFT, H. H., Popular History of the Mexican People.** 8vo. 15s.
- BANKS, Mrs. G. LINNÆUS, God's Providence House.** Cr. 8vo. 6s.
- BARING-GOULD, S., Germany, Present and Past.** New and Cheaper Edition. Large cr. 8vo. 7s. 6d.
- BARNES, WILLIAM, Poems of Rural Life in the Dorset Dialect.** New Edition. Cr. 8vo. 6s.
- BARTH, A., Religions of India.** Translated by the Rev. J. WOOD. Third Edition. Post 8vo. 16s. (*Trübner's Oriental Series.*)
- BARTLETT, J. R., Dictionary of Americanisms : a Glossary of Words and Phrases colloquially used in the United States.** Fourth Edition. 8vo. 21s.
- BASU, K. P., Students' Mathematical Companion.** Containing Problems in Arithmetic, Algebra, Geometry, and Mensuration, for Students of the Indian Universities. Cr. 8vo. 6s.
- BASTIAN, H. CHARLTON, The Brain as an Organ of Mind.** With 184 Illustrations. Fourth Edition. Cr. 8vo. 5s. (*J.S.S.*)
- BAUGHAN, ROSA, The Influence of the Stars : a Treatise on Astrology, Chiromancy, and Physiognomy.** Second Edition. 8vo. 5s.
- BAUR, FERDINAND, Philological Introduction to Greek and Latin for Students.** Translated and adapted from the German by C. KEGAN PAUL and E. D. STONE. Third Edition. Cr. 8vo. 6s.
- BEAL, S., Catena of Buddhist Scriptures.** From the Chinese. 8vo. 15s.
Romantic Legend of Sakya Buddha. From the Chinese-Sanskrit. Cr. 8vo. 12s.
Life of Hiuen-Tsiang. By the Shamans HWUI LI and YEN-TSUNG. With an Account of the Works of I-Tsing. Post 8vo. 10s. (*Trübner's Oriental Series.*)
- SI-YU-KI : Buddhist Records of the Western World.** Translated from the Chinese of HIUEN-TSIANG (A.D. 629). With Map. 2 vols. post 8vo. 24s. (*Trübner's Oriental Series.*)
- Texts from the Buddhist Canon, commonly known as Dhammapada.** Translated from the Chinese. Post 8vo. 7s. 6d. (*Trübner's Oriental Series.*)
- BEAMES, JOHN, Outlines of Indian Philology.** With a Map showing the Distribution of Indian languages. Enlarged Edition. Cr. 8vo. 5s.
Comparative Grammar of the Modern Aryan Languages of India : Hindi, Panjabi, Sindhi, Gujarati, Marathi, Oriya, and Bengali. 3 vols. 8vo. 16s. each.
- BELL, A. M., Elocutionary Manual.** Fifth Edition Revised. 12mo. 7s. 6d.
- BELLOWS, JOHN, French and English Dictionary for the Pocket.** Containing the French-English and English-French Divisions on the same page; Conjugating all the Verbs; Distinguishing the Genders by Different Types; giving Numerous Aids to Pronunciation, &c. Fifty-third Thousand of the Second Edition. 32mo. morocco tuck, 12s. 6d.; roan, 10s. 6d.
Tous les Verbes. Conjugations of all the Verbs in French and English. Second Edition. With Tables of Weights, Measures, &c. 32mo. 6d.
- BENEDEN, P. J. van, Animal Parasites and Messmates.** With 83 Illustrations. Fourth Edition. Cr. 8vo. 5s. (*J.S.S.*)
- BENFEY, THEODOR, Grammar of the Sanskrit Language.** For the Use of Early Students. Second Edition. Roy. 8vo. 10s. 6d.
- BENSON, A. C., William Laud, sometime Archbishop of Canterbury.** With Portrait. Cr. 8vo. 6s.

- BENSON, MARY ELEANOR**, *At Sundry Times and in Divers Manners*. With Portrait and Memoir. 2 vols. cr. 8vo. 10s. 6d.
- BENTHAM, JEREMY**, *Theory of Legislation*. Translated from the French of Etienne Dumont by R. HILDRETH. Seventh Edition. Post 8vo. 7s. 6d.
- 'BERNARD,'** *From World to Cloister; or, My Novitiate*. Cr. 8vo. 5s.
- BERNSTEIN, Prof.**, *The Five Senses of Man*. With 91 Illustrations. Fifth Edition. Cr. 8vo. 5s. (*I.S.S.*)
- BERTIN, GEORGE**, *Abridged Grammar of the Languages of the Cuneiform Inscriptions*. Cr. 8vo. 5s.
- BEVAN, THEODORE F.**, *Toll, Travel, and Discovery in British New Guinea*. With 5 Maps. Large cr. 8vo. 7s. 6d.
- BHIKSHU, SUBHADRA**, *Buddhist Catechism*. 12mo. 2s.
- Bibliographica—Volume I**. Containing the first four parts. Bound in half-morocco (Roxburgh style). Large imperial 8vo. £2. 2s. net.
- BINET, A., and FERE, C.**, *Animal Magnetism*. Second Edition. Cr. 8vo. 5s. (*I.S.S.*)
- BISHOP, M. C.**, *The Prison Life of Marie Antoinette and her Children, the Dauphin and the Duchesse D'Angoulême*. New and Revised Edition. With Portrait. Cr. 8vo. 6s.
- BLADES, W.**, *Biography and Typography of William Caxton, England's First Printer*. 8vo. hand-made paper, imitation old bevelled binding, £1. 1s.; Cheap Edition, cr. 8vo. 5s.
- Account of the German Morality Play, entitled, 'Depositio Cornuti Typographici.'** As performed in the 17th or 18th Centuries. With facsimile illustrations. Sm. 4to. 7s. 6d.
- BLAKE, WILLIAM**, *Selections from the Writings of*. Edited, with Introduction, by LAURENCE HOUSMAN. With Frontispiece. Elzevir 8vo. Parchment or cloth, 6s.; vellum, 7s. 6d. (*Parchment Library.*)
- BLASERNA, Prof. P.**, *Theory of Sound in its Relation to Music*. With numerous Illustrations. Fourth Edition. Cr. 8vo. 5s. (*I.S.S.*)
- BLOGG, H. B.**, *Life of Francis Duncan*. With Introduction by the BISHOP OF CHESTER. Cr. 8vo. 3s. 6d.
- BLOOMFIELD**, *The Lady, Reminiscences of Court and Diplomatic Life*. New and Cheaper Edition, with Frontispiece. Cr. 8vo. 6s.
- BLUNT, WILFRID SCAWEN**, *The Wind and the Whirlwind*. 8vo. 1s. 6d.
- The Love Sonnets of Proteus**. Fifth Edition. Elzevir 8vo. 5s.
- In Vinculis**. With Portrait. Elzevir 8vo. 5s.
- A New Pilgrimage, and other Poems**. Elzevir 8vo. 5s.
- Esther, Love Lyrics, and Natalia's Resurrection**. 7s. 6d.
- BOGER, Mrs. E.**, *Myths, Scenes, and Worthies of Somerset*. Cr. 8vo. 10s. 6d.
- BOJESSEN, MARIA**, *Guide to the Danish Language*. 12mo. 5s.
- BOSANQUET, BERNARD**, *Introduction to Hegel's Philosophy of Fine Art*. Cr. 8vo. 5s.
- BOSE, P. NATH**, *A History of Hindu Civilization during British Rule*. Volumes 1 and 2. Cr. 8vo. 15s.
- BOSWELL, C. STUART**, *The Vita Nuova and its Author*. Cr. 8vo. 3s. 6d. net.
- BOWDEN, Fr. CHARLES HENRY**, *Life of B. John Juvenal Ancina*. 8vo. 9s.

- BOWEN, H. C., Studies in English.** For the use of Modern Schools. Tenth thousand Sm. cr. 8vo. 1s. 6d.
English Grammar for Beginners. Fcp. 8vo. 1s.
Simple English Poems. English Literature for Junior Classes, 3s. Parts I. II. and III. 6d. each. Part IV. 1s.
- BOYD, P., Nāgānanda ;** or, the Joy of the Snake World. From the Sanskrit of Sri-Harsha-Deva. Cr. 8vo. 4s. 6d.
- BRACKENBURY, Major-General, Field Works :** their Technical Construction and Tactical Application. 2 vols. Sm. cr. 8vo. 12s. (*Military Handbooks.*)
- BRADSHAW'S Guide.** Dictionary of Mineral Waters, Climatic Health Resorts, Sea Baths, and Hydropathic Establishments. With a Map. 3s. 6d. ; without Map, 2s. 6d.
- Brave Men's Footsteps :** a Book of Example and Anecdote for Young People. By the editor of 'Men who have Risen,' Illustrations by C. DOYLE. Ninth Edition. Cr. 8vo. 2s. 6d.
- BRENTANO, LUJO, History and Development of Gilds, and the Origin of Trade Unions.** 8vo. 3s. 6d.
- BRETSCHNEIDER, E., Mediæval Researches from Eastern Asiatic Sources :** Fragments towards the Knowledge of the Geography and History of Central and Western Asia, from the 13th to the 17th century, with 2 Maps. 2 vols. Post 8vo. 21s. (*Trübner's Oriental Series.*)
- BRETTE, P. H., THOMAS, F., French Examination Papers set at the University of London.** Part I. Matriculation, and the General Examination for Women. Cr. 8vo. 3s. 6d. Key, 5s. Part II. First B.A. Examinations for Honours and D. Litt. Examinations. Cr. 8vo. 7s.
- BRIDGETT, T. E., Blunders and Forgeries :** Historical Essays. Cr. 8vo. 6s.
History of the Holy Eucharist in Great Britain. 2 vols. 8vo. 18s.
- BROOKE, Rev. STOFFORD A., The Fight of Faith :** Sermons preached on various occasions. Sixth Edition, cr. 8vo. 5s.
The Spirit of the Christian Life. Fourth Edition. Cr. 8vo. 5s.
Theology in the English Poets : Cowper, Coleridge, Wordsworth, and Burns. Sixth Edition. Post 8vo. 5s.
Christ in Modern Life. Eighteenth Edition. Cr. 8vo. 5s.
Sermons. Two Series. Thirteenth Edition. Cr. 8vo. 5s. each.
Life and Letters of F. W. Robertson. With Portrait. 2 vols. Cr. 8vo. 7s. 6d. Library Edition, 8vo. with portrait, 12s. Popular Edition, cr. 8vo. 6s.
- BROWN, C. P., Sanskrit Prosody and Numerical Symbols Explained.** 8vo. 3s. 6d.
- BROWN, HORATIO F., Venetian Studies.** Cr. 8vo. 7s. 6d.
- BROWN, Rev. J. BALDWIN, The Higher Life :** its Reality, Experience, and Destiny. Seventh Edition. Cr. 8vo. 5s.
Doctrine of Annihilation in the Light of the Gospel of Love. Fourth Edition. Cr. 8vo. 2s. 6d.
The Christian Policy of Life : a Book for Young Men of Business. Third Edition. Cr. 8vo. 3s. 6d.
- BROWNE, EDGAR A., How to Use the Ophthalmoscope.** Third Edition. Cr. 8vo. 3s. 6d.
- BROWNING, OSCAR, Introduction to the History of Educational Theories.** Second Edition. 3s. 6d. (*Education Library.*)
- BRUGMANN, KARL, Comparative Grammar of the Indo-Germanic Languages.** 3 vols. 8vo. Vol. I. Introduction and Phonology, 18s. Vol. II. Morphology (Stem-Formation and Inflection), Part I, 16s. Vol. III. 12s. 6d. Vol. IV. 20s. Index to the Four Volumes. 8vo. 9s.

- BRUN, L. LE, Materials for Translating English into French.** Seventh Edition. Post 8vo. 4s. 6d.
- BRYANT, W. CULLEN, Poems.** Cheap Edition. Sm. 8vo. 3s. 6d.
- BRYCE, J., Handbook of Home Rule:** being Articles on the Irish Question. Second Edition. Cr. 8vo, 1s. 6d.; paper covers, 1s.
- Two Centuries of Irish History.** 8vo. 16s.
- BUDGE, E. A., History of Esarhaddon** (Son of Sennacherib), King of Assyria, B.C. 681-668. Translated from the Cuneiform Inscriptions in the British Museum. Post 8vo. 10s. 6d. (*Trübner's Oriental Series.*)
- Archæal Classics:** Assyrian Texts, being Extracts from the Annals of Shalmaneser II., Sennacherib, and Assur-Bani-Pal, with Philological Notes. Sm. 4to. 7s. 6d.
- Saint Michael the Archangel.** Three Encomiums in the Coptic Texts, with a Translation. Imperial 8vo. 15s. net.
- The Book of Governors:** The Historica Monastica of Thomas, Bishop of Marga. 2 vols. 8vo. 40s. net.
- BUNGE, Prof. G., Text-Book of Physiological and Pathological Chemistry,** for Physicians and Students. Translated from the German by L. C. WOOLDRIDGE. 8vo. 16s.
- BUNSEN, ERNEST DE, Islam;** or, True Christianity. Crown 8vo. 5s.
- BURGESS, JAMES, The Buddhist Cave-Temples and their Inscriptions,** containing Views, Plans, Sections, and Elevation of Façades of Cave-temples; Drawings of Architectural and Mythological Sculptures; Facsimiles of Inscriptions, &c.; with Descriptive and Explanatory Text, and Translations of Inscriptions. With 86 Plates and Woodcuts. Royal 4to. half-bound, £3. 3s. [*Archæological Survey of Western India.*]
- Elura Cave-Temples and the Brahmanical and Jaina Caves in Western India.** With 66 Plates and Woodcuts. Royal 4to. half-bound, £3. 3s. [*Archæological Survey of Western India.*]
- Reports of the Amaravati and Jaggayyapeta Buddhist Stupas,** containing numerous Collo type and other Illustrations of Buddhist Sculpture and Architecture, &c., in South-eastern India; Facsimiles of Inscriptions, &c., with Descriptive and Explanatory Text; together with Transcriptions, Translations, and Elucidations of the Dhauli and Jaugada Inscriptions of Asoka. With numerous Plates and Woodcuts. Royal 4to. half-bound, £4. 4s. [*Archæological Survey of Southern India.*]
- BURNELL, A. C., Elements of South Indian Palæography,** from the 4th to the 17th century: an Introduction to the Study of South Indian Inscriptions and MSS. Enlarged Edition. With Map and 35 Plates. 4to. £2. 12s. 6d.
- The Ordinances of Manu.** Translated from the Sanskrit, with Introduction by the late A. C. BURNELL. Completed and Edited by E. W. HOPKINS. Post 8vo. 12s. (*Trübner's Oriental Series.*)
- BURNEY, Capt., R.N., The Young Seaman's Manual and Rigger's Guide.** Tenth Edition, revised and corrected. With 200 Illustrations and 16 Sheets of Signals. Cr. 8vo. 7s. 6d.
- BURNS, ROBERT, Selected Poems of.** With an Introduction by ANDREW LANG. Elzevir 8vo. vellum, 7s. 6d.; parchment or cloth, 6s. (*Parchment Library.*)
- BURR, F. M., Life and Works of Alexander Anderson,** the First American Wood Engraver. Demy 8vo. 21s.
- BURROWS, HENRY WILLIAM, Memorials by E. Wordsworth.** With Portrait. Cr. 8vo. 6s.
- BUTLER, F., Spanish Teacher and Colloquial Phrase-Book.** 18mo. half-roan, 2s. 6d.
- BUXTON, Major, Elements of Military Administration.** First part: Permanent System of Administration. Small cr. 8vo. 7s. 6d. (*Military Handbooks.*)
- BYRNE, Dean JAMES, General Principles of the Structure of Language.** 2 vols. Second and Revised Edition. 8vo. 36s.
- Origin of Greek, Latin, and Gothic Roots.** Second and Revised Edition. 8vo. 18s.

- CABLE, G. W.,** *Strange True Stories of Louisiana.* 8vo. 7s. 6d.
- CAIRD, MONA,** *The Wing of Azrael.* Cr. 8vo. 6s.
- CAMERINI, E.,** *L'Eco Italiano: a Guide to Italian Conversation, with Vocabulary.* 12mo. 4s. 6d.
- CAMERON, Miss,** *Soups and Stews and Choice Ragoûts.* Cr. 8vo. cloth, 1s. 6d. paper covers, 1s.
- CAMOENS' Luslads.** Portuguese Text, with Translation, by J. J. AUBERTIN. Second Edition. 2 vols. Cr. 8vo. 12s.
- CAMPBELL, Prof. LEWIS, Sophocles.** *The Seven Plays in English Verse.* Cr. 8vo. 7s. 6d.
- Æschylus.** *The Seven Plays in English Verse.* Cr. 8vo. 7s. 6d.
- Candid Examination of Theism.** By PHYSICUS. Second Edition, post 8vo. 7s. 6d. (*Philosophical Library.*)
- CANDOLLE, ALPHONSE DE,** *Origin of Cultivated Plants.* Second Edition. Cr. 8vo. 5s. (*J.S.S.*)
- CARLYLE, THOMAS, Sartor Resartus.** Elzevir 8vo. vellum, 7s. 6d.; parchment or cloth, 6s. (*Parchment Library.*)
- CARPENTER, R. L.,** *Personal and Social Christianity: Sermons and Addresses* by the late RUSSELL LANT CARPENTER. With a Short Memoir by FRANCES E. COOKE. Edited by J. ESTLIN CARPENTER. Cr. 8vo. 6s.
- CARPENTER, W. B.,** *Principles of Mental Physiology,* with their Applications to the Training and Discipline of the Mind, and the Study of its Morbid Conditions. Illustrated. Sixth Edition. 8vo. 12s.
- Nature and Man.** With a Memorial Sketch by J. ESTLIN CARPENTER. Portrait. Large cr. 8vo. 8s. 6d.
- CARREÑO, Metodo para aprender a Leer, escribir y hablar el Inglés** segun el sistema de Ollendorff. 8vo. 4s. 6d. Key, 3s.
- CARRINGTON, H.,** *Of the Imitation of Christ.* By THOMAS A KEMPIS. A Metrical Version. Cr. 8vo. 5s.
- CASSAL, CHARLES,** *Glossary of Idioms, Gallicisms, and other Difficulties contained in the Senior Course of the 'Modern French Reader.'* Cr. 8vo. 2s. 6d.
- CASSAL, CH., and KARCHER, THEODORE.** *Modern French Reader.* Junior Course. Nineteenth Edition. Cr. 8vo. 2s. 6d. Senior Course. Seventh Edition. Cr. 8vo. 4s. Senior Course and Glossary in 1 vol. Cr. 8vo. 6s.
- Little French Reader:** extracted from the 'Modern French Reader.' Third Edition. Cr. 8vo. 2s.
- CATLIN, GEORGE, O-Kee-Pa:** a Religious Ceremony; and other Customs of the Mandans. With 13 coloured Illustrations. Small 4to. 14s.
- The Lifted and Subsidied Rocks of America,** with their Influence on the Oceanic, Atmospheric, and Land Currents, and the Distribution of Races. With 2 Maps. Cr. 8vo. 6s. 6d.
- Shut your Mouth and Save your Life.** With 29 Illustrations. Ninth Edition, Cr. 8vo. 2s. 6d.
- CHAMBERLAIN, Prof. B. H.,** *Classical Poetry of the Japanese.* Post 8vo. 7s. 6d. (*Trübner's Oriental Series.*)
- Simplified Japanese Grammar.** Cr. 8vo. 5s.
- Romanised Japanese Reader.** Consisting of Japanese Anecdotes and Maxims, with English Translations and Notes. 12mo. 6s.
- Handbook of Colloquial Japanese.** 8vo. 12s. 6s.
- Things Japanese.** Second, Revised Edition. Cr. 8vo. 8s. 6d.

CHAMBERS, J. D., Theological and Philosophical Works of Hermes Trismegistus, Christian Neoplatonist. Translated from the Greek. 8vo. 7s. 6d.

CHAUCER, G., Canterbury Tales. Edited by A. W. POLLARD. 2 vols. Elzevir 8vo. vellum, 15s.; parchment or cloth, 12s. (*Parchment Library.*)

CHEYNE, Canon T. K., The Prophecies of Isaiah. With Notes and Dissertations. 2 vols. Fifth Edition, Revised. 8vo. 25s.

Job and Solomon; or, The Wisdom of the Old Testament. 8vo. 12s. 6d.

The Book of Psalms; or, the Praises of Israel. With Commentary. 8vo. 16s.

The Book of Psalms. Elzevir 8vo. vellum, 7s. 6d.; parchment or cloth, 6s. (*Parchment Library.*)

The Origin and Religious Contents of the Psalter. The Bampton Lectures, 1889. 8vo. 16s.

CHILDERS, R. C., Pali-English Dictionary, with Sanskrit Equivalents. Imp. 8vo. £3. 3s.

CHRISTIAN, JOHN, Behar Proverbs, Classified and arranged according to subject matter, with Notes. Post 8vo. 10s. 6d. (*Trübner's Oriental Series.*)

Civil War (American), Campaigns of the. 12 vols., and Supplement. With Maps and Plans. 12mo. 5s. each vol. **Navy in the Civil War.** 3 vols. 5s. each.

CLAIRAUT, Elements of Geometry. Translated by Dr. KAINES. With 145 Figures. Cr. 8vo. 4s. 6d.

CLAPPERTON, JANE HUME, Scientific Melliorism and the Evolution of Happiness. Large cr. 8vo. 8s. 6d.

CLARKE, HENRY W., History of Tithes from Abraham to Queen Victoria. Cr. 8vo. 5s.

CLARKE, JAMES FREEMAN, Ten Great Religions: an Essay in Comparative Theology. 2 vols. 8vo. 10s. 6d. each.

CLERY, Gen. C. FRANCIS, Minor Tactics. With 26 Maps and Plans. Eleventh Edition, revised. Cr. 8vo. 9s.

CLIFFORD, W. KINGDON, Common Sense of the Exact Sciences. Second Edition. With 100 Figures. Cr. 8vo. 5s. (*I.S.S.*)

CLODD, EDWARD, Childhood of the World: a Simple Account of Man in early times. Ninth Edition. Cr. 8vo. 3s. Special Edition for Schools, 1s.

Childhood of Religions. Including a simple account of the birth and growth of Myths and Legends. Ninth Edition. Cr. 8vo. 5s. Special Edition for Schools, 1s. 6d.

Jesus of Nazareth. With a brief Sketch of Jewish History to the time of His birth. Second Edition. Revised throughout and partly re-written. Sm. cr. 8vo. 6s. Special Edition for Schools, in 2 parts, 1s. 6d. each.

COLERIDGE. Memoir and Letters of Sara Coleridge. Edited by her Daughter. Cheap Edition. With Portrait. Cr. 8vo. 7s. 6d.

COLLETTE, C. H., Life, Times, and Writings of Thomas Cranmer, D.D., the First Reforming Archbishop of Canterbury. 8vo. 7s. 6d.

Pope Joan. An Historical Study, from the Greek of Rhoidis. 12mo. 2s. 6d.

COLLINS, MABEL, Through the Gates of Gold: a Fragment of Thought. Sm. 8vo. 4s. 6d.

Light on the Path. Fcp. 8vo. 1s. net.

COMPTON, A. G., First Lessons in Metal-Working. Cr. 8vo. 6s. 6d.

COMPTON, C. G., Scot Free: a Novel. Cr. 8vo. 6s.

COMSTOCK, JOHN HENRY and ANNA B., A Manual for the Study of Insects. Royal 8vo. 25s. net.

- COMTE, AUGUSTE**, Catechism of Positive Religion, from the French, by R. CONGREVE. Third Edition, revised and corrected. Cr. 8vo. 2s. 6d.
- Eight Circulars of Auguste Comte.** Fcp. 8vo. 1s. 6d.
- Appeal to Conservatives.** Cr. 8vo. 2s. 6d.
- Positive Philosophy of Auguste Comte**, translated and condensed by HARRIET MARTINEAU. 2 vols. New and Cheaper Edition. Large post 8vo. 15s.
- Subjective Synthesis**; or, Universal System of the Conceptions adapted to the Normal State of Humanity. Vol. I., containing the System of Positive Logic. 8vo. paper covers, 2s. 6d.
- CONTE, JOSEPH LE**, Sight: an Exposition of the Principles of Monocular and Binocular Vision. Second Edition. With 132 Illustrations. Cr. 8vo. 5s. (*I.S.S.*)
- CONTOPOULOS, N.**, Lexicon of Modern Greek-English and English-Modern Greek. 2 vols. 8vo. 27s.
- Modern-Greek and English Dialogues and Correspondence.** Fcp. 8vo. 2s. 6d.
- CONWAY, M. D.**, Emerson at Home and Abroad. With Portrait. Post 8vo. 10s. 6d. (*Philosophical Library.*)
- CONWAY, R. S.**, Verner's Law in Italy: an Essay in the History of the Indo-European sibilants. 8vo. 5s.
- COOK, A. J.**, The Bee Keeper's Guide; or, Manual of the Apiary. 15th edition. Revised, enlarged, re-written, and beautifully illustrated. Cr. 8vo. 7s. 6d.
- COOK, KENINGALE**, The Fathers of Jesus. A Study of the Lineage of the Christian Doctrine and Traditions. 2 vols. 8vo. 28s.
- COOK, LOUISA S.**, Geometrical Psychology; or, The Science of Representation. An Abstract of the Theories and Diagrams of B. W. Betts. 16 Plates. 8vo. 7s. 6d.
- COOKE, M. C.**, British Edible Fungi: how to distinguish and how to cook them. With Coloured Figures of upwards of Forty Species. Cr. 8vo. 7s. 6d.
- Fungi**: their Nature, Influences, Uses, &c. Edited by Rev. M. J. BERKELEY. With numerous Illustrations. Fourth Edition. Cr. 8vo. 5s. (*I.S.S.*)
- Introduction to Fresh-Water Algae.** With an Enumeration of all the British Species. With 13 Plates. Cr. 8vo. 5s. (*I.S.S.*)
- COOKE, Prof. J. P.**, New Chemistry. With 31 Illustrations. Ninth Edition. Cr. 8vo. 5s. (*I.S.S.*)
- Laboratory Practice.** A Series of Experiments on the Fundamental Principles of Chemistry. Cr. 8vo. 5s.
- CORDERY, J. G.**, Homer's *Iliad*. Greek Text, with Translation. 2 vols. 8vo. 14s. Translation only, cr. 8vo. 5s.
- CORY, W.**, Guide to Modern English History. Part I. 1815-1830. 8vo. 9s. Part II. 1830-1835. 8vo. 15s.
- COTTA, BERNHARD von**, Geology and History. A Popular Exposition of all that is known of the Earth and its Inhabitants in Prehistoric Times. 12mo. 2s.
- COTTON, LOUISE**, Palmistry and its Practical Uses. With 12 Plates. Second Edition. Cr. 8vo. 2s. 6d.
- COWELL, E. B.**, Short Introduction to the Ordinary Prakrit of the Sanskrit Dramas. Cr. 8vo. 3s. 6d.
- Prakrita-Prakasa**; or, The Prakrit Grammar of Vararuchi, with the Commentary (Manorama) of Bhamaha. 8vo. 14s.
- COWELL, E. B.**, and **GOUGH, A. E.**, The Sarva-Darsana-Samgraha; or, Review of the Different Systems of Hindu Philosophy. Post 8vo. 10s. 6d. (*Trübner's Oriental Series.*)
- COWIE, Bishop**, Our Last Year in New Zealand, 1887. Cr. 8vo. 7s. 6d.
- COX, SAMUEL, D.D.**, Commentary on the Book of Job. With a Translation. Second Edition. 8vo. 15s.
- Salvator Mundi**; or, Is Christ the Saviour of all Men? Fourteenth Edition. Cr. 8vo. 2s. 6d.
- The Larger Hope**: A Sequel to 'Salvator Mundi.' Second Edition. 16mo. 1s.

- COX, SAMUEL, D.D.,** *The Genesis of Evil*, and other Sermons, mainly Expository. Fourth Edition. Cr. 8vo. 6s.
Balaam: an Exposition and a Study. Cr. 8vo. 5s.
Miracles: an Argument and a Challenge. Cr. 8vo. 2s. 6d.
- COX, Sir G. W., Bart.,** *Mythology of the Aryan Nations*. New Edition. 8vo. 16s.
Tales of Ancient Greece. New Edition. Sm. cr. 8vo. 6s.
Tales of the Gods and Heroes. Sm. cr. 8vo. 3s. 6d.
Manual of Mythology in the Form of Question and Answer. New Edition. Fcap. 8vo. 3s.
Introduction to the Science of Comparative Mythology and Folk-lore. Second Edition. Cr. 8vo. 7s. 6d.
- COX, Sir G. W., Bart.,** and **JONES, E. H.,** *Popular Romances of the Middle Ages*. Third Edition. Cr. 8vo. 6s.
- CRAVEN, Mrs.,** *A Year's Meditations*. Cr. 8vo. 6s.
- CRAVEN, T.,** *English-Hindustani and Hindustani-English Dictionary*. New Edition. 18mo. 4s. 6d.
- CRAWFURD, OSWALD,** *Portugal, Old and New*. With Illustrations and Maps. New and Cheaper Edition. Cr. 8vo. 6s.
- CRUISE, F. R.,** *Notes of a Visit to the Scenes in which the Life of Thomas à Kempis was spent*. With numerous Illustrations. 8vo. 12s.
- CUNNINGHAM, Major-Gen. ALEX.,** *Ancient Geography of India*. I. The Buddhist Period, including the Campaigns of Alexander and the Travels of Hwen-Thsang. With 13 Maps. 8vo. £1. 8s.
- CURTEIS, Canon,** *Bishop Selwyn of New Zealand and of Lichfield: a Sketch of his Life and Work, with further gleanings from his Letters, Sermons, and Speeches*. Large cr. 8vo. 7s. 6d.
- GUST, R. N.,** *Linguistic and Oriental Essays*. Post 8vo. First Series, 10s. 6d.; Second Series, with 6 Maps, 21s.; Third Series, with Portrait, 21s. (*Trübner's Oriental Series*.)
- DANA, E. S.,** *Text-Book of Mineralogy*. With Treatise on Crystallography and Physical Mineralogy. Third Edition, with 800 Woodcuts and Plate. 8vo. 15s.
- DANA, J. D.,** *Text-Book of Geology, for Schools*. Illustrated. Cr. 8vo. 10s.
Manual of Geology. Illustrated by a Chart of the World, and 1,000 Figures. 8vo. 28s. Fourth Edition.
The Geological Story Briefly Told. Illustrated. 12mo. 7s. 6d.
- DANA, J. D.,** and **BRUSH, G. J.,** *System of Mineralogy*. Sixth Edition, entirely rewritten and enlarged. Roy. 8vo. £2. 12s. 6d.
Manual of Mineralogy and Petrography. Fourth Edition. Numerous Woodcuts. Cr. 8vo. 6s. net.
- DANTE'S** Treatise '*De Vulgari Eloquentiâ*.' Translated, with Notes, by A. G. F. HOWELL. 3s. 6d.
The Banquet (Il Convito). Translated by KATHARINE HILLARD. Cr. 8vo. 7s. 6d.
- DARMESTERER, ARSENE,** *Life of Words as the Symbols of Ideas*. Cr. 8vo. 4s. 6d.
- D'ASSIER, ADOLPHE,** *Posthumous Humanity: a Study of Phantoms*. From the French by H. S. OLCOTT. With Appendix. Cr. 8vo. 7s. 6d.
- DAVIDS, T. W. RHYS,** *Buddhist Birth-Stories; or, Jataka Tales*. The oldest Collection of Folk-lore extant. Being the Jātakatthavannanā. Translated from the Pali Text of V. FAUSBOLL. Post 8vo. 18s. (*Trübner's Oriental Series*.)
The Numismata Orientalia. Part VI. The Ancient Coins and Measures of Ceylon. With 1 Plate. Royal 4to. Paper wrapper, 10s.
- DAVIDSON, SAMUEL, D.D.,** *Canon of the Bible: its Formation, History, and Fluctuations*. Third Edition. Sm. Cr. 8vo. 5s.
Doctrine of Last Things. Sm. Cr. 8vo. 3s. 6d.
Introduction to the New Testament. Third Edition. Revised and Enlarged. 2 vols. demy 8vo. 30s.

- DAVIES, G. CHRISTOPHER.** *Rambles and Adventures of Our School Field Club.* With 4 Illustrations. New and Cheaper Edition. Cr. 8vo. 3s. 6d.
- DAVIES, J.,** *Sāṅkhya Kārikā of Iśwara Krishna: an Exposition of the System of Kapila.* Post 8vo. 6s. (*Trübner's Oriental Series.*)
- The Bhagavad Gītā;** or, the Sacred Lay. Translated, with Notes, from the Sanskrit. Third Edition. Post 8vo. 6s. (*Trübner's Oriental Series.*)
- DAWSON, GEORGE, Prayers.** First Series, Edited by his WIFE. Eleventh Edition. Sm. 8vo. 3s. 6d.
- Prayers.** Second Series. Edited by GEORGE ST. CLAIR. Second Edition. Sm. 8vo. 3s. 6d.
- Sermons on Disputed Points and Special Occasions.** Edited by his WIFE. Fifth Edition. Sm. 8vo. 3s. 6d.
- Sermons on Daily Life and Duty.** Edited by his WIFE. Fifth Edition. Sm. 8vo. 3s. 6d.
- The Authentic Gospel.** Sermons. Edited by GEORGE ST. CLAIR. Fourth Edition. Sm. 8vo. 3s. 6d.
- Every-Day Counsels.** Edited by GEORGE ST. CLAIR. Cr. 8vo. 6s.
- Biographical Lectures.** Edited by GEORGE ST. CLAIR. Third Edition. Large cr. 8vo. 7s. 6d.
- Shakespeare;** and other Lectures. Edited by GEORGE ST. CLAIR. Large Cr. 8vo. 7s. 6d.
- DAWSON, Sir J. W., Geological History of Plants.** With 80 Illustrations. Cr. 8vo. 5s. (*J.S.S.*)
- DELBRUCK, B., Introduction to the Study of Language: the History and Methods of Comparative Philology of the Indo-European Languages.** 8vo. 5s.
- DEMBO, Dr. J. A., The Jewish Method of Slaughter.** Cr. 8vo. 2s. 6d. net.
- DENNIS, J., Collection of English Sonnets.** Sm. Cr. 8vo. 2s. 6d.
- DENNYS, N. B., Folk-Lore of China, and its Affinities with that of the Aryan and Semitic Races.** 8vo. 10s. 6d.
- DENVIR, JOHN, The Irish in Britain, from the Earliest Times to the Fall and Death of Parnell.** Cr. 8vo. 2s. 6d.
- DEWEY, JOHN, Psychology.** Large Cr. 8vo. 5s. 6d.
- DEWEY, J. H., The Way, the Truth, and the Life: a Handbook of Christian Theosophy, Healing and Psychic Culture.** 10s. 6d.
- DIDON, Father, Jesus Christ.** Cheaper Edition. 2 vols. 8vo. 12s.
- Belief in the Divinity of Jesus Christ.** Cr. 8vo. 5s.
- DILLON, W., Life of John Mitchel.** With Portrait. 2 vols. 8vo. 21s.
- DOBSON, AUSTIN, Old World Idylls, and other Verses.** With Frontispiece. Eleventh Edition. Elzevir 8vo. 6s.
- At the Sign of the Lyre.** With Frontispiece. Eighth Edition. Elzevir 8vo. 6s.
- The Ballad of Beau Brocade;** and other Poems of the Eighteenth Century. With Fifty Illustrations by Hugh Thomson. Cr. 8vo. 5s.
- Proverbs in Porcelain.** With 25 Illustrations by BERNARD PARTRIDGE. 5s.
- The Story of Rosina;** and other Poems. With 49 Illustrations by HUGH THOMSON. Cr. 8vo. 5s.
- Poems on Several Occasions.** With 7 full-page Etchings by ADOLPHE LALAUZE, and Portrait of the Author etched from life by WILLIAM STRANG. 2 vols. demy 8vo.
- The Edition will consist of 100 copies on Holland paper, in which every full-page plate will be a *remarque* proof, and the Portrait will be signed by the Author; and 250 copies on deckle-edge paper, with the Etchings on Whatman paper. The prices will be £3. 3s. net and £1. 5s. net respectively. This is the fullest edition of Mr. Austin Dobson's Poems yet published in England or America.

- DORMAN, MARCUS R.**, *From Matter to Mind.* Cr. 8vo. 7s. 6d.
- D'ORSEY, A. J. D.**, *Grammar of Portuguese and English.* Adapted to Ollendorff's System. Fourth Edition. 12mo. 7s.
Colloquial Portuguese; or, the Words and Phrases of Every-day Life. Fourth Edition. Cr. 8vo. 3s. 6d.
- DOUGLAS, Prof. R. K.**, *Chinese Language and Literature.* Cr. 8vo. 5s.
The Life of Jenghiz Khan. Translated from the Chinese. Cr. 8vo. 5s.
- DOWDEN, EDWARD**, *Shakspeare: a Critical Study of His Mind and Art.* Tenth Edition. Large post 8vo. 12s.
Shakspeare's Sonnets. With Introduction and Notes. Large post 8vo. 7s. 6d.
Shakspeare's Sonnets. Edited, with Frontispiece after the Death Mask. Elzevir 8vo. vellum, 7s. 6d.; parchment or cloth, 6s. (*Parchment Library.*)
Studies in Literature. 1789-1877. Fifth Edition. Large post 8vo. 6s.
Transcripts and Studies. Large post 8vo. 12s.
Life of Percy Bysshe Shelley. With Portraits. 2 vols. 8vo. 36s.
New Studies in Literature. Large post 8vo. 12s.
- DOWNING, C.**, *Fruits and Fruit Trees of America: or, the Culture and Management of Fruit Trees generally.* Illustrated. 8vo. 25s.
- DOWSON, JOHN**, *Grammar of the Urdû or Hindûstânî Language.* Second Edition. Cr. 8vo. 10s. 6d.
Hindûstânî Exercise Book. Passages and Extracts for Translation into Hindûstânî. Cr. 8vo. 2s. 6d.
Classical Dictionary of Hindu Mythology and History, Geography and Literature. Post 8vo. 16s. (*Trübner's Oriental Series.*)
- DRAPER, J. W.**, *The Conflict between Religion and Science.* 21st Edition. Cr. 8vo. 5s. (*J.S.S.*)
- DRAYSON, Major-General**, *Untrodden Ground in Astronomy and Geology.* With Numerous Figures. 8vo. 14s.
- DRENNAN, J. S.**, *Poems and Sonnets.* Small cr. 8vo. 3s. 6d.
- DUFF, E. GORDON**, *Early Printed Books.* With Frontispiece and Ten Plates. Post 8vo. 6s. net. (*Books about Books.*)
Early English Printing: A Portfolio of Facsimiles illustrating the History of Printing in England in the Fifteenth Century. Edited by E. GORDON DUFF. Royal Folio 42s. net.
- DUFFY, Sir C. GAVAN**, *Thomas Davis: the Memoirs of an Irish Patriot, 1840-46.* 8vo. 12s.
- DUKA, THEODORE**, *Life and Works of Alexander Csoma de Körös between 1819 and 1842.* With a Short Notice of all his Works and Essays, from Original Documents. Post 8vo. 9s. (*Trübner's Oriental Series.*)
- DUNN, H. P.**, *Infant Health: the Physiology and Hygiene of Early Life.* Sm. Cr. 8vo. 3s. 6d.
- DURUY, VICTOR**, *History of Greece.* With Introduction by Prof. J. P. MAHAFFY. 8 vols. Super royal 8vo. £8. 8s.
- DUSAR, P. FRIEDRICH**, *Grammar of the German Language.* With Exercises. 2nd Edition. Cr. 8vo. 4s. 6d.
Grammatical Course of the German Language. 3rd Edition. Cr. 8vo. 3s. 6d.
- DUTT, ROMESH CHUNDER**, *History of Civilisation in Ancient India, based on Sanskrit literature.* Revised Edition. In 2 vols. 8vo. 21s.
Lays of Ancient India: Selections from Indian Poetry rendered into English Verse. Post 8vo. 7s. 6d.
- DUTT, TORU**, *Ancient Ballads and Legends of Hindustan.* With an Introductory Memoir by EDMUND GOSSE. 18mo. cloth extra, gilt top, 5s.

- EASTWICK, E. B., The Gulistan ;** or, Rose Garden of Shekh Mushliu-'d-Din Sadi of Shiraz. Translated from the Atiah Kadah. 2nd Edition. Post 8vo. 10s. 6d. (*Trübner's Oriental Series.*)
- EDGREN, H., Compendious Sanskrit Grammar.** With a Brief Sketch of Scenic Prakrit. Cr. 8vo. 10s. 6d.
- EDKINS, J., D.D., Religion in China.** Containing a Brief Account of the Three Religions of the Chinese. 3rd Edition. Post 8vo. 7s. 6d. (*Philosophical Library and Trübner's Oriental Series.*)
- Chinese Buddhism : Sketches Historical and Critical.** Post 8vo. 18s. (*Trübner's Oriental Series.*)
- EGER, GUSTAV, Technological Dictionary in the English and German Languages.** 2 vols. roy. 8vo. £1. 7s.
- Eighteenth Century Essays.** Edited by AUSTIN DOBSON. With Frontispiece. Elzevir 8vo. vellum, 7s. 6d.; parchment or cloth, 6s. (*Parchment Library.*)
- EITEL, E. J., Buddhism : its Historical, Theoretical, and Popular Aspects.** Third Edition, revised, 8vo. 5s.
- Handbook for the Student of Chinese Buddhism.** Second Edition. Cr. 8vo. 18s.
- Electricity in Daily Life : a Popular Account of its Application to Every-day Uses.** With 125 Illustrations. Sq. 8vo. 9s.
- ELLIOTT, EBENEZER, Poems.** Edited by his Son, the Rev. EDWIN ELLIOTT, of St. John's, Antigua. 2 vols. crown 8vo. 18s.
- ELLIOTT, F. R., Handbook for Fruit Growers.** Illustrated. Sq. 16mo. 5s.
- Handbook of Practical Landscape Gardening.** Illustrated. 8vo. 7s. 6d.
- ELLIOT, Sir H. M., History, Folk-lore, and Distribution of the Races of the North-Western Provinces of India.** Edited by J. BEAMES. With 3 Coloured Maps. 2 vols. 8vo. £1. 16s.
- History of India,** as told by its own Historians : the Muhammadan Period. From the Posthumous Papers of the late Sir H. M. ELLIOT. Revised and continued by Professor JOHN DOWSON. 8 vols. 8vo. £8. 8s.
- ELLIOT, Sir W., Coins of Southern India.** With Map and Plates. Roy. 4to. 25s. (*Numismata Orientalia.*)
- ELLIS, W. ASHTON, Wagner Sketches : 1849.** A Vindication. Cr. 8vo. cloth, 2s. 6d.; paper, 2s.
- Richard Wagner's Prose Works.** Translated by W. A. ELLIS. Vol. I. The Art Work of the Future. 8vo. 12s. 6d. net.
- Richard Wagner's Prose Works.** Translated by W. A. ELLIS. Vol. II. The Drama. 8vo. 12s. 6d. net.
- Richard Wagner's Prose Works.** Translated by W. A. ELLIS. Vol. III. The Theatre. 8vo. 12s. 6d. net.
- ELTON, CHARLES and MARY, The Great Book Collectors.** With 10 Illustrations. Post 8vo. 6s. net. (*Books about Books.*)
- Encyclopædia Americana.** 4 vols. 4to. £8. 8s.
- English Comic Dramatists.** Edited by OSWALD CRAWFURD. Elzevir 8vo. vellum, 7s. 6d.; parchment or cloth, 6s. (*Parchment Library.*)
- English Lyrics.** Elzevir 8vo. vellum, 7s. 6d.; parchment or cloth, 6s. (*Parchment Library.*)
- English Odes.** Edited by E. GOSSE. With Frontispiece. Elzevir 8vo. vellum, 7s. 6d.; parchment or cloth, 6s. (*Parchment Library.*)
- English Sacred Lyrics.** Elzevir 8vo. vellum, 7s. 6d.; parchment or cloth, 6s. (*Parchment Library.*)

- English Poets (Living).** With Frontispiece by HERBERT RAILTON. 1894 Edition. Large cr. 8vo. printed on hand-made paper, vellum, 15s.; cloth or parchment, 12s.
- English Verse.** CHAUCER to BURNS. TRANSLATIONS. LYRICS OF THE NINETEENTH CENTURY. DRAMATIC SCENES and CHARACTERS. BALLADS AND ROMANCES. Edited by W. J. LINTON and R. H. STODDARD. 5 vols. cr. 8vo. 5s. each.
- EYTON, ROBERT, The Apostles' Creed :** Sermons. Cr. 8vo. 3s. 6d.
The True Life, and Other Sermons. Second Edition. Cr. 8vo. 6s.
The Lord's Prayer : Sermons. Cr. 8vo. 3s. 6d.
The Ten Commandments : Sermons. Cr. 8vo. 3s. 6d.
The Search for God, and other Sermons. Cr. 8vo. 3s. 6d.
The Temptation of Jesus, and other Sermons. Cr. 8vo. 3s. 6d.
The Beatitudes. Sermons. Cr. 8vo. 3s. 6d.
- FABER, E., The Mind of Mencius ;** or, Political Economy founded upon Moral Philosophy. A systematic digest of the doctrines of the Chinese philosopher, Mencius. Original text Classified and Translated. Post 8vo. 10s. 6d. (*Trübner's Oriental Series.*)
- FAUSBOLL, V., The Jataka, together with its Commentary ;** being Tales of the Anterior Birth of Gotama Buddha. 5 vols. 8vo. 28s. each.
- FERGUSON, T., Chinese Researches :** Chinese Chronology and Cycles. Cr. 8vo. 10s. 6d.
- FEUERBACH, L., Essence of Christianity.** From the German, by MARIAN EVANS. Second Edition. Post 8vo. 7s. 6d. (*Philosophical Library.*)
- FICHTE, J. GOTTLIEB, New Exposition of the Science of Knowledge.** Translated by A. E. KROEGER. 8vo. 6s.
Science of Knowledge. From the German, by A. E. KROEGER. With an Introduction by Prof. W. T. HARRIS. Post 8vo. 10s. 6d. (*Philosophical Library.*)
Science of Rights. From the German by A. E. KROEGER. With an Introduction by Prof. W. T. HARRIS. Post 8vo. 12s. 6d. (*Philosophical Library.*)
Popular Works : The Nature of the Scholar ; The Vocation of the Scholar ; The Vocation of Man ; The Doctrine of Religion ; Characteristics of the Present Age ; Outlines of the Doctrine of Knowledge. With a Memoir by W. SMITH. Post 8vo. 2 vols. 21s. (*Philosophical Library.*)
- FINN, ALEXANDER, Persian for Travellers.** Oblong 32mo. 5s.
- FITZARTHUR, T., The Worth of Human Testimony.** Fcp. 8vo. 2s.
- FITZGERALD, R. D., Australian Orchids.** Part I., 7 Plates ; Part II., 10 Plates ; Part III., 10 Plates ; Part IV., 10 Plates ; Part V., 10 Plates ; Part VI., 10 Plates. Each Part, coloured, 21s.; plain, 10s. 6d. Part VII., 10 Plates. Vol. II., Part I., 10 Plates. Each, coloured, 25s.
- FITZPATRICK, W. J., Life of the Very Rev. T. N. Burke.** With Portrait. 2 vols. 8vo. 30s. New and Revised Edition. Cr. 8vo. 7s. 6d.
- FLETCHER, J. S., The Winding Way.** Cr. 8vo. 6s.
- FLINN, D. EDGAR, Ireland : its Health Resorts and Watering Places.** With Frontispiece and Maps. 8vo. 5s.
- FLOWER, W. H., The Horse : a Study in Natural History.** Cr. 8vo. 2s. 6d. (*Modern Science Series.*)
- FOREMAN, STEPHEN, The City of the Crimson Walls and other Poems.** cr. 8vo. 3s. 6d.
- FORNANDER, A., Account of the Polynesian Race : its Origin and Migrations, and the Ancient History of the Hawaiian People.** Post 8vo. Vol. I., 7s. 6d. Vol. II., 10s. 6d. Vol. III., 9s. (*Philosophical Library.*)
- FORNEY, MATTHIAS N., Catechism of the Locomotive.** Second Edition, revised and enlarged. Fcp. 4to. 18s.

- FRASER, Sir WILLIAM, Bart., Disraeli and His Day.** Second Edition.
Post 8vo. 9s.
- FRAZAR, DOUGLAS, Practical Boat Sailing:** a Treatise on Management of Small Boats and Yachts. Sm. cr. 4s. 6d.
- FREEBOROUGH, E., and RANKEN, C.E., Chess Openings, Ancient and Modern.**
Revised and Corrected up to the Present Time from the best Authorities.
Large post 8vo. 8s.
- FREEBOROUGH, E., Chess Endings.** A Companion to 'Chess Openings, Ancient and Modern.' Edited and Arranged. Large post 8vo. 7s. 6d.
Select Chess End Games. Edited and arranged. Cr. 8vo. 1s. 6d. net.
- FREEMAN, E. A., Lectures to American Audiences.** I. The English People in its Three Homes. II. Practical Bearings of General European History.
Post 8vo. 9s.
- French Jansenists.** By the Author of 'Spanish Mystics' and 'Many Voices.' Cr. 8vo. 6s.
- French Lyrics.** Edited by GEORGE SAINTSEBURY. With Frontispiece. Elzevir 8vo. vellum, 7s. 6d.; parchment or cloth, 6s. (*Parchment Library.*)
- FRIEDLÄNDER, M., Text-Book of Jewish Religion.** Third Edition, revised.
Cr. 8vo. 1s. 6d.
The Jewish Religion. Cr. 8vo. 5s.
- FRIEDRICH, P., Progressive German Reader.** With copious Notes. Cr. 8vo. 4s. 6d.
- FRITH, I., Life of Giordano Bruno, the Nolan.** Revised by Prof. MORRIS CARRIERE. With Portrait. Post 8vo. 14s. (*Philosophical Library.*)
- FROMBLING, F. OTTO, Graduated German Reader:** a Selection from the most popular writers. With a Vocabulary. Twelfth Edition. 12mo. 3s. 6d.
Graduated Exercises for Translation into German: Extracts from the best English Authors, with Idiomatic Notes. Cr. 8vo. 4s. 6d.; without Notes, 4s. net.
- FULLER, ANDREW S., The Grape Cultivist: A Treatise on the Cultivation of the Native Grape.** Cr. 8vo. 7s. 6d.
- FULLER, F. W., Evadne, and other Poems.** Small cr. 8vo. 3s. 6d.
- GALL, Capt. H. R., Tactical Questions and Answers on the Infantry Drill Book 1892.** Third Edition. Cr. 8vo. 1s. 6d.
- GARDINER, SAMUEL R., and MULLINGER, J. BASS, Introduction to the Study of English History.** Third and enlarged edition. Post 8vo. 7s. 6d. net.
- GARDNER, PERCY, The Numismata Orientalia.** Part V. The Parthian Coinage. With 8 Plates. Royal 4to. Paper wrapper, 18s.
- GARLANDA, FEDERICO, The Fortunes of Words.** Cr. 8vo. 5s.
The Philosophy of Words: a popular introduction to the Science of Language. Cr. 8vo. 5s.
- GARRICK, DAVID.** By JOSEPH KNIGHT. With Portrait. Demy 8vo. 10s. 6d. net.
- GASTER, M., Greeko-Slavonic Literature, and its Relation to the Folklore of Europe during the Middle Ages.** Large Post 8vo. 7s. 6d.
- GAY, JOHN, Fables.** Edited by AUSTIN DOBSON. With Portrait. Elzevir 8vo. vellum, 7s. 6d.; parchment or cloth, 6s. (*Parchment Library.*)
- GEIGER, LAZARUS, Contributions to the History of the Development of the Human Race.** From the German by D. ASHER. Post 8vo. 6s. (*Philosophical Library.*)
- GELDART, E. M., Guide to Modern Greek.** Post 8vo. 7s. 6d. Key, 2s. 6d.
Simplified Grammar of Modern Greek. Cr. 8vo. 2s. 6d.

- GEORGE, HENRY, Progress and Poverty :** an Inquiry into the Causes of Industrial Depressions, and of Increase of Want with Increase of Wealth ; the Remedy. Fifth Edition. Post 8vo. 7s. 6d. Cabinet Edition, cr. 8vo. 2s. 6d. Cheap Edition, limp cloth, 1s. 6d. ; paper covers, 1s.
- Protection or Free Trade :** an Examination of the Tariff Question, with especial regard to the interests of labour. Second Edition. Cr. 8vo. 5s. Cheap Edition, limp cloth, 1s. 6d. ; paper covers, 1s.
- Social Problems.** Fourth Thousand. Cr. 8vo. 5s. Cheap Edition, limp cloth, 1s. 6d. ; paper covers, 1s.
- A Perplexed Philosopher :** being an Examination of Mr. HERBERT SPENCER's various utterances on the Land Question, &c. Cr. 8vo. 5s. Cheap Edition. Limp cloth, 1s. 6d. ; paper covers, 1s.
- GIBB, E. J. W., The History of the Forty Vezirs ;** or, The Story of the Forty Morns and Eves. Translated from the Turkish. Cr. 8vo. 10s. 6d.
- GILBERT. Autobiography, and other Memorials of Mrs. Gilbert.** Edited by JOSIAH GILBERT. Fifth Edition. Cr. 8vo. 7s. 6d.
- GLANVILL, JOSEPH, Scep sis Scientifica.** Edited, with Introductory Essay, by JOHN OWEN. Elzevir 8vo. 6s.
- GLAZE BROOK, R. T., Laws and Properties of Matter.** Cr. 8vo. 2s. 6d. (*Modern Science.*)
- GOLDSMITH, Oliver, Vicar of Wakefield.** Edited by AUSTIN DOBSON. Elzevir 8vo. vellum, 7s. 6d. ; parchment or cloth, 6s. (*Parchment Library.*)
- GOMME, G. L., Ethnology in Folklore.** Cr. 8vo. 2s. 6d. (*Modern Science.*)
- GOOCH, Diaries of Sir Daniel Gooch, Bart.** With an Introductory Notice by Sir THEODORE MARTIN, K.C.B. With 2 Portraits and an Illustration. Cr. 8vo. 6s.
- GOODCHILD, JOHN A., The Two Thrones.** Cr. 8vo. 3s. 6d.
- GOODENOUGH. Memoir of Commodore J. G. Goodenough.** Edited by his Widow. With Portrait. Third Edition. Cr. 8vo. 5s.
- GORDON, Major-General C. G., Journals at Khartoum.** Printed from the original MS. With Introduction and Notes by A. EGMONT HAKE. Portrait, 2 Maps, and 30 Illustrations. 8vo. 21s. Cheap Edition, 6s.
- Last Journal :** a Facsimile of the last Journal received in England from General Gordon, reproduced by Photo-lithography. Imp. 4to. £3. 3s.
- Gospel according to Matthew, Mark, and Luke (The).** Elzevir 8vo. vellum, 7s. 6d. ; parchment or cloth, 6s. (*Parchment Library.*)
- GOSSIP, G. H. D., The Chess-Player's Text-Book :** an Elementary Treatise on the Game of Chess. Numerous Diagrams. 16mo. 2s.
- GOUGH, A. E., Philosophy of the Upanishads.** Post 8vo. 9s. (*Trübner's Oriental Series.*)
- GOWER, Lord RONALD, Brie-à-Brac.** Being some Photoprints illustrating Art Objects at Gower Lodge, Windsor. With Letterpress descriptions. Super roy. 8vo. 15s. ; extra binding, 21s.
- Last Days of Marie Antoinette :** an Historical Sketch. With Portrait and Facsimiles. Fcp. 4to. 10s. 6d.
- Notes of a Tour from Brindisi to Yokohama, 1883-1884.** Fcp. 8vo. 2s. 6d.
- Rupert of the Rhine :** a Biographical Sketch of the Life of Prince Rupert. With 3 Portraits. Cr. 8vo. buckram, 6s.
- Stafford House Letters.** With 2 Portraits. 8vo. 10s. 6d.
- My Reminiscences.** New edition. Post 8vo. 7s. 6d.

- GRAHAM, WILLIAM**, *The Creed of Science: Religious, Moral, and Social*. Second Edition, revised. Cr. 8vo. 6s.
- The Social Problem, in its Economic, Moral and Political Aspects.* 8vo. 14s.
- Socialism New and Old.* Second Edition. Cr. 8vo. 5s. (*J.S.S.*)
- GRAY, J.**, *Ancient Proverbs and Maxims from Burmese Sources; or, The Niti Literature of Burma.* Post 8vo. 6s. (*Trübner's Oriental Series.*)
- GRAY, MAXWELL**, *Silence of Dean Maitland.* Eighth Edition. With Frontispiece. Cr. 8vo. 6s.
- The Reproach of Annesley.* Fifth Edition. With Frontispiece. Cr. 8vo. 6s.
- In the Heart of the Storm.* With Frontispiece by GORDON BROWNE. Cr. 8vo. 6s.
- Westminster Chimes, and other Poems.* Sm. 8vo. 5s.
- An Innocent Impostor.* With Frontispiece. Cr. 8vo. 6s.
- A Costly Freak.* With Frontispiece. Cr. 8vo. 6s.
- GREEN, F. W. EDRIDGE**, *Colour Blindness and Colour Perception.* With 3 Coloured Plates. Cr. 8vo. 5s. (*J.S.S.*)
- GREG, R. P.**, *Comparative Philology of the Old and New Worlds in Relation to Archæic Speech.* With copious Vocabularies. Super royal 8vo. £1. 11s. 6d.
- GREG, W. R.**, *Literary and Social Judgments.* Fourth Edition. 2 vols. Cr. 8vo. 15s.
- The Creed of Christendom.* Eighth Edition. 2 vols. post 8vo. 15s. (*Philosophical Library.*)
- Enigmas of Life.* Seventeenth Edition. Post 8vo. 10s. 6d. (*Philosophical Library.*)
- Enigmas of Life.* With a Prefatory Memoir. Edited by his WIFE. Nineteenth Edition. Cr. 8vo. 6s.
- Political Problems for our Age and Country.* 8vo. 10s. 6d.
- Miscellaneous Essays.* Two Series. Cr. 8vo. 7s. 6d. each.
- GREY, ROWLAND**, *In Sunny Switzerland: a Tale of Six Weeks.* Second Edition. Sm. 8vo. 5s.
- Lindenblumen, and other Stories.* Sm. 8vo. 5s.
- By Virtue of His Office.* Cr. 8vo. 6s.
- Jacob's Letter, and other Stories.* Cr. 8vo. 5s.
- GRIFFIN, Sir Lepel**, *The Rajas of the Punjab: History of the Principal States in the Punjab, and their Political Relations with the British Government.* Royal 8vo. 21s.
- GRIFFIS, W. E.**, *The Mikado's Empire.* Book I. History of Japan from B.C. 660 to A.D. 1872. Book II. Personal Experiences, Observations, and Studies in Japan, 1870-1874. Second Edition, illustrated. 8vo. 20s.
- Japanese Fairy World: Stories from the Wonder-Lore of Japan.* With 12 Plates. Square 16mo. 3s. 6d.
- GRIFFITH, R. T. H.**, *Birth of the War-God: a Poem from the Sanskrit of KĀLIDĀSĀ.* Second Edition, Post 8vo. 5s. (*Trübner's Oriental Series.*)
- Yūsef and Zulaikha: a Poem by JĀMI.* Translated from the Persian into English verse. Post 8vo. 8s. 6d. (*Trübner's Oriental Series.*)
- GRIMLEY, H. N.**, *The Prayer of Humanity: Sermons on the Lord's Prayer.* Cr. 8vo. 3s. 6d.
- The Temple of Humanity, and other Sermons.* Cr. 8vo. 6s.
- GRIMSHAW, R.**, *Engine Runner's Catechism.* A Sequel to the Author's 'Steam Engine Catechism.' Illustrated. 18mo. 8s. 6d.

- GROTEFELT, GÖSTA**, *The Principles of Modern Dairy Practice*. Translated by F. W. Woll. Cr. 8vo. 10s. 6d.
- GUBERNATIS, ANGELO DE**, *Zoological Mythology; or, The Legends of Animals*. 2 vols. 8vo. £1. 8s.
- GUICCIARDINI, FRANCESCO**, *Counsels and Reflections*. Translated by N. H. Thomson. Cr. 8vo. 6s.
- GURNEY, ALFRED**, *The Vision of the Eucharist, and other Poems*. Cr. 8vo. 5s.
A Christmas Faggot. Sm. 8vo. 5s.
Voices from the Holy Sepulchre, and other Poems. Cr. 8vo. 5s.
Wagner's Parsifal: a Study. Second Edition. Fcp. 8vo. 1s. 6d.
Our Catholic Inheritance in the Larger Hope. Cr. 8vo. 1s. 6d.
The Story of a Friendship. Cr. 8vo. 5s.
- HADDON, CAROLINE**, *The Larger Life: Studies in Hinton's Ethics*. Cr. 8vo. 5s.
- HAECKEL, Prof. ERNST**, *The History of Creation*. New Edition. Translation revised by Professor E. RAY LANKESTER, with 20 plates and numerous figures. Fourth Edition. 2 vols. Large post 8vo. 32s.
- The History of the Evolution of Man**. With numerous illustrations. 2 vols. Post 8vo. 32s.
- A Visit to Ceylon**. Post 8vo. 7s. 6d.
- Freedom in Science and Teaching**. With a Prefatory Note by Prof. T. H. HUXLEY. Cr. 8vo. 5s.
- HAGGARD, H. RIDER**, *Cetywayo and His White Neighbours; or, Remarks on Recent Events in Zululand, Natal, and the Transvaal*. Fourth Edition. Cr. 8vo. 6s.
- HAGGARD, W. H., and LE STRANGE, G.**, *The Vazir of Lankuran: a Persian Play*. With a Grammatical Introduction, Translation, Notes, and Vocabulary. Cr. 8vo. 10s. 6d.
- HAHN, T.**, *Tsuni-1 Goam, the Supreme Being of the Khoi-Khoi*. Post 8vo. 7s. 6d. (*Trübner's Oriental Series*.)
- HAIG, Major-General**, *The Indus Delta Country*. With three maps. Royal 8vo. 5s. net.
- HALLECK'S International Law; or, Rules Regulating the Intercourse of States in Peace and War**. Third Edition, thoroughly revised by Sir SHERSTON BAKER, Bart. 2 vols. 8vo. 38s.
- HALLOCK, CHARLES**, *The Sportsman's Gazetteer and General Guide to the Game Animals, Birds, and Fishes of North America*. Maps and Portrait. Cr. 8vo. 15s.
- HAMILTON**, *Memoirs of Arthur Hamilton, B.A., of Trinity College, Cambridge*. Cr. 8vo. 6s.
- HAMMERSTON, OLOF**, *A Text-book of Physiological Chemistry*. 8vo. 20s.
- HARDY, W. J.**, *Book Plates*. With Frontispiece and 36 Illustrations of Book Plates. Post 8vo. 6s. net. (*Books about Books*.)
- HARRISON, CLIFFORD**, *In Hours of Leisure*. Second Edition. Cr. 8vo. 5s.
- HARRISON, Col. R.**, *Officer's Memorandum Book for Peace and War*. Fourth Edition, revised. Oblong 32mo. red basil, with pencil, 3s. 6d.
- HARRISON, J. A., and BASKERVILL, W.**, *Handy Dictionary of Anglo-Saxon Poetry*. Sq. 8vo. 12s.
- HARTMANN, EDUARD von**, *Philosophy of the Unconscious*. Translated by W. C. COUPLAND. 3 vols. Post 8vo. 31s. 6d. (*Philosophical Library*.)
- HARTMANN, FRANZ**, *Magic, White and Black; or, The Science of Finite and Infinite Life*. Fourth Edition, revised. Cr. 8vo. 6s.
- The Life of Paracelsus, and the Substance of his Teachings**. Post 8vo. 10s. 6d.
- Life and Doctrines of Jacob Boehme: an Introduction to the Study of his Works**. Post 8vo. 10s. 6d.

- HARTMANN, R.**, *Anthropoid Apes*. With 63 Illustrations. Second Edition. Cr. 8vo. 5s. (*I.S.S.*)
- HARVEY, M.** *Newfoundland as it is in 1894*. With coloured Map. Cr. 8vo. 5s.
- HARVEY, W. F.**, *Simplified Grammar of the Spanish Language*. Cr. 8vo. 3s. 6d.
- HAUG, M.**, *Essays on the Sacred Language, Writings, and Religion of the Parsis*. Third Edition. Edited and Enlarged by E. W. WEST. Post 8vo. 16s. (*Trübner's Oriental Series*.)
- HAWEIS, H. R.**, *Current Coin*. Materialism—The Devil—Crime—Drunkenness—Pauperism—Emotion—Recreation—The Sabbath. Sixth Edition. Cr. 8vo. 5s.
Arrows in the Air. Fifth Edition. Cr. 8vo. 5s.
Speech in Season. Sixth Edition. Cr. 8vo. 5s.
Thoughts for the Times. Fourteenth Edition. Cr. 8vo. 5s.
Unsectarian Family Prayers. Fourth Edition. Fcp. 8vo. 1s. 6d.
- HAWTHORNE, NATHANIEL**, *Works*. Complete in 12 vols. Large post 8vo. 7s. 6d. each. (*Scarlet Letter*. New Illustrated Edition. Post 8vo. 10s. 6d.)
- HEAD, BARCLAY V.**, *The Numismata Orientalia*. Part III. The Coinage of Lydia and Persia, from the Earliest Times to the Fall of the Dynasty of the Achæmenidæ. With 3 Plates. Royal 4to. Paper wrapper, 10s. 6d.
- HEALES, Major ALFRED**, *The Architecture of the Churches of Denmark*. 8vo. 14s.
- HEATH, FRANCIS GEORGE**, *Autumnal Leaves*. With 12 Coloured Plates. Third and Cheaper Edition. 8vo. 6s.
Sylvan Winter. With 70 Illustrations. 14s.
- HEATH, RICHARD**, *Edgar Quinet: His Early Life and Writings*. With Portraits, Illustrations, and an Autograph Letter. Post 8vo. 12s. 6d. (*Philosophical Library*.)
- HEGEL**. *Lectures on the History of Philosophy*. Translated by E. S. HALDANE. 3 vols. Post 8vo. each 12s.
- The Introduction to Hegel's Philosophy of Fine Art*, translated by BERNARD BOSANQUET. Cr. 8vo. 5s.
- HEIDENHAIN, RUDOLPH**, *Hypnotism, or Animal Magnetism*. With Preface by G. J. ROMANES. Second Edition. Sm. 8vo. 2s. 6d.
- HEILPRIN, Prof. A.**, *Bermuda Islands*. 8vo. 18s.
Geographical and Geological Distribution of Animals. With Frontispiece. Cr. 8vo. 5s. (*I.S.S.*)
- HEINE, H.**, *Religion and Philosophy in Germany*. Translated by J. SNODGRASS. Post 8vo. 6s. (*Philosophical Library*.)
- HENDRIKS, DOM LAWRENCE**, *The London Charterhouse: its Monks and its Martyrs*. Illustrated. 8vo. 15s.
- HENSLOW, Prof. G.**, *Origin of Floral Structures through Insect and other Agencies*. With 88 Illustrations. Cr. 8vo. 5s. (*I.S.S.*)
The Origin of Plant Structures. Cr. 8vo. 5s. (*I.S.S.*)
- HEPBURN, J. C.**, *Japanese and English Dictionary*. Second Edition. Imp. 8vo. half-roan, 18s.
Japanese-English and English-Japanese Dictionary. Third Edition. Royal 8vo. half-morocco, cloth sides, 30s. Pocket Edition, square 16mo. 14s.
- HERMES TRISMEGISTUS**, *Works*. Translated by J. D. CHAMBERS. Post 8vo. 7s. 6d.
- The Virgin of the World*. Translated and Edited by the Authors of 'The Perfect Way.' Illustrations. 4to. imitation parchment, 10s. 6d.

HERSHON, P. J., *Talmudic Miscellany*; or, One Thousand and One Extracts from the Talmud, the Midrashim, and the Kabbalah. Post 8vo. 14s. (*Trübner's Oriental Series.*)

HICKSON, S. J., *The Fauna of the Deep Sea.* Cr. 8vo. 2s. 6d. (*Modern Science Series.*)

HILLEBRAND, KARL, *France and the French in the Second Half of the 19th Century.* From the third German Edition. Post 8vo. 10s. 6d.

HINTON. *Life and Letters of James Hinton.* With an Introduction by Sir W. W. GULL, and Portrait engraved on steel by C. H. JEENS. Sixth Edition. Cr. 8vo. 8s. 6d.

Philosophy and Religion. Selections from the Manuscripts of the late James Hinton. Edited by CAROLINE HADDON. Second Edition. Cr. 8vo. 5s.

The Law-Breaker and The Coming of the Law. Edited by MARGARET HINTON. Cr. 8vo. 6s.

The Mystery of Pain. New Edition. Fcp. 8vo. 1s.

HIRSCHFELD, H., *Arabic Chrestomathy in Hebrew Characters.* With a Glossary. 8vo. 7s. 6d.

HODGSON, B. H., *Essays on the Languages, Literature, and Religion of Nepal and Tibet.* Roy. 8vo. 14s.

Essays relating to Indian Subjects. 2 vols. Post 8vo. 28s. (*Trübner's Oriental Series.*)

HODGSON, J. E., *Academy Lectures.* Cr. 8vo. 7s. 6d.

HOLMES-FORBES, A. W., *The Science of Beauty: an Analytical Inquiry into the Laws of Aesthetics.* Second Edition. Post 8vo. 3s. 6d.

HOLMES, OLIVER WENDELL, *John Lothrop Motley: a Memoir.* Cr. 8vo. 6s.
Life of Ralph Waldo Emerson. With Portrait. English Copyright Edition. Cr. 8vo. 6s.

HOLST, H. VON. *The French Revolution: Tested by Mirabeau's career.* 2 vols. 8vo. 18s.

HOMER'S Iliad. Greek Text, with Translation by J. G. CORDERY. 2 vols. 8vo. 14s.
Translation only, cr. 8vo. 5s.

HOOPER, MARY, *Little Dinners: How to Serve them with Elegance and Economy.* Twenty-second Edition. Cr. 8vo. 2s. 6d.

Cookery for Invalids, Persons of Delicate Digestion, and Children. Fifth Edition. Cr. 8vo. 2s. 6d.

Every-day Meals: being Economical and Wholesome Recipes for Breakfast, Luncheon, and Supper. Seventh Edition. Cr. 8vo. 2s. 6d.

HOPE, Mrs., *The First Divorce of Henry VIII.: As told in the State Papers.* Cr. 8vo. 6s.

HOPKINS, ELLICE, *Work amongst Working Men.* Sixth Edition. Cr. 8vo. 3s. 6d.

HORATIUS FLACCUS, Q., *Opera.* Edited by F. A. CORNISH. With Frontispiece. Elzevir 8vo. vellum, 7s. 6d.; parchment or cloth, 6s. (*Parchment Library.*)

HORNADAY, W. T., *Two Years in a Jungle.* With Illustrations. 8vo. 21s.

Taxidermy and Zoological Collecting; with Chapters on Collecting and Preserving Insects, by W. J. HOLLAND, D.D. With 24 Plates and 85 Illustrations. 8vo. 10s. 6d.

HORNE, H. P., *The Binding of Books.* With 12 Plates. Post 8vo. 6s. net. (*Books about Books.*)

HOSPITALIER, E., *The Modern Applications of Electricity.* Translated and Enlarged by JULIUS MAIER. Second Edition, revised, with many Additions and Numerous Illustrations. 2 vols. 8vo. 25s.

- HOUSMAN, LAWRENCE**, *The House of Joy*. With 9 illustrations, and cover specially designed by the Author. Cr. 8vo. 6s.
- A Farm in Fairyland**. With 12 illustrations by the Author. Cr. 8vo. 6s.
- HOWE, HENRY MARION**, *The Metallurgy of Steel*. Vol. I. Second Edition, revised and enlarged. Royal 4to. £2. 12s. 6d.
- HUGHES, HENRY**, *The Theory of Inference*. 8vo. 10s. 6d.
- HULME, F. EDWARD**, *Mathematical Drawing Instruments, and How to Use Them*. With Illustrations. Fifth Edition, imperial 16mo, 3s. 6d.
- HUMBOLDT, Baron W. von**, *The Sphere and Duties of Government*. From the German by J. COULTHARD. Post 8vo, 5s.
- HUSMANN, G.**, *American Grape Growing and Wine Making*. Illustrated. 12mo. 7s. 6d.
- HUTCHINSON, A. B.**, *The Mind of Mencius*; or, Political Economy founded upon Moral Philosophy. A Systematic Digest of the Doctrines of the Chinese Philosopher Mencius. Translated from the German of FABER, with Additional Notes. Post 8vo. 10s. 6d. (*Trübner's Oriental Series*.)
- HUTCHINSON, Colonel**, and **MACGREGOR, Major**, *Military Sketching and Reconnaissance*. Fifth Edition, with 16 Plates. Sm. cr. 8vo. 4s. (*Military Handbooks*.)
- HUXLEY, Prof. T. H.**, *The Crayfish: an Introduction to the Study of Zoology*. With 82 Illustrations. Fifth Edition. Cr. 8vo. 5s. (*I.S.S.*)
- IHNE, W.**, *Latin Grammar for Beginners*. Ahn's System. 12mo. 3s.
- IM THURN, EVERARD F.**, *Among the Indians of Guiana: Sketches, Chiefly Anthropologic, from the Interior of British Guiana*. With 53 Illustrations and a Map. 8vo. 18s.
- INGELOW, JEAN**, *Off the Skelligs: a Novel*. With Frontispiece. Cr. 8vo. 6s.
- INMAN, JAMES**, *Nautical Tables*. Designed for the use of British Seamen. New Edition, revised and enlarged. 8vo. 16s.
- IVANOFF'S Russian Grammar**. Sixteenth Edition. Translated, Enlarged, and Arranged for use of Students by Major W. E. GOWAN. 8vo. 6s.
- JACOB, G. A.**, *Manual of Hindu Pantheism: the Vedāntasāra*. Third Edition, post 8vo. 6s. (*Trübner's Oriental Series*.)
- JANEWAY, CATHERINE**, *Ten Weeks in Egypt and Palestine*. With illustrations. Cr. 8vo. 5s.
- Japan Society of London**, *Transactions and Proceedings of*. Large post 8vo. cloth, 17s. Paper, 15s.
- JAPP, ALEXANDER H.**, *Days with Industrials: Adventures and Experiences among Curious Industries*. With Illustrations. Cr. 8vo. 6s.
- JÄSCHKE, H. A.**, *Tibetan Grammar*. Prepared by Dr. H. WENZEL. Second Edition. Cr. 8vo. 5s.
- JENKINS, E.**, and **RAYMOND, J.**, *Architect's Legal Handbook*. Fourth Edition, revised. Cr. 8vo. 6s.
- JENKINS, JABEZ**, *Vest-Pocket Lexicon*. An English Dictionary of all except Familiar Words, including the principal Scientific and Technical Terms. 64mo. roan, 1s. 6d.; cloth, 1s.
- JENKINS, Canon R. C.**, *Heraldry, English and Foreign*. With a Dictionary of Heraldic Terms and 156 Illustrations. Sm. 8vo. 3s. 6d.
- JENNINGS, HARGRAVE**, *The Indian Religions; or, Results of the Mysterious Buddhism*. 8vo. 10s. 6d.
- JESSOP, C. MOORE**, *Past and Future; or, Fable and Fact*. Cr. 8vo. 5s.
- JEVONS, W. STANLEY**, *Money and the Mechanism of Exchange*. Ninth Edition. Cr. 8vo. 5s. (*I.S.S.*)

JOEL, L., Consul's Manual, and Shipowner's and Shipmaster's Practical Guide in their Transactions Abroad. 8vo. 12s.

Johns Hopkins University Studies in History and Politics. Edited by HERBERT B. ADAMS. Nine Annual Series, and nine Extra Volumes. 8vo. £10. 10s. Also sold separately.

JOHNSON, J. B., Theory and Practice of Surveying. Designed for use of Students in Engineering. Illustrated. Second Edition. 8vo. 18s.

JOHNSON, J. B., and BRYAN, C. W., The Theory and Practice of Modern Framed Structures. Designed for the Use of Schools. With Illustrations. 4to. £2. 10s.

JOHNSON, S. W., How Crops Feed : a Treatise on the Atmosphere and the Soil as related to Nutrition of Plants. Illustrated. Cr. 8vo. 10s.

How Crops Grow : a Treatise on the Chemical Composition, Structure, and Life of the Plant. Illustrated. Cr. 8vo. 10s.

JOHNSON, SAMUEL, Oriental Religions and their Relation to Universal Religion—Persia. 8vo. 18s.

Oriental Religions and their Relation to Universal Religion—India. 2 vols. 21s. (*Philosophical Library.*)

JOHNSTON, H. H., The Kilima-njaro Expedition : a Record of Scientific Exploration in Eastern Equatorial Africa. With 6 Maps and 80 Illustrations. 8vo. 21s.

History of a Slave. With 47 Illustrations. Square 8vo. 6s.

JOLLY, JULIUS, Naradiya Dharma-Sastra : or, The Institutes of Narada. Translated from the Sanskrit. Cr. 8vo. 10s. 6d.

Manava-Dharma-Castra : the Code of Manu. Original Sanskrit Text. With Critical Notes. Post 8vo. 10s. 6d. (*Trübner's Oriental Series.*)

JOLY, N., Man before Metals. With 148 Illustrations. Fourth Edition. Cr. 8vo. 5s. (*J.S.S.*)

JONCOURT, Madame MARIE DE, Wholesome Cookery. Fifth Edition. Cr. 8vo. cloth, 1s. 6d. ; paper covers, 1s.

JUDD, Prof. J. W., Volcanoes : what they are and what they teach. With 96 Illustrations on Wood. Fourth Edition. Cr. 8vo. 5s. (*J.S.S.*)

Kalender of Shepherdes. Facsimile Reprint. With Introduction and Glossary by Dr. H. OSKAR SOMMER. £2. 2s. net.

KARCHER, THÉODORE, Questionnaire Français : Questions on French Grammar, Idiomatic Difficulties, and Military Expressions. Fourth Edition. Cr. 8vo. 4s. 6d. ; interleaved with writing paper, 5s. 6d.

KARMARSCH, KARL, Technological Dictionary. Fourth Edition, revised. Imp. 8vo. 3 vols.

Vol. 1.—German-English-French, 12s.

Vol. 2.—English-German-French, 12s.

Vol. 3.—French-German-English, 15s.

KAUFMANN, M., Socialism : its Nature, its Dangers, and its Remedies considered. Cr. 8vo. 7s. 6d.

Utopias ; or, Schemes of Social Improvement, from Sir Thomas More to Karl Marx. Cr. 8vo. 5s.

Christian Socialism. Cr. 8vo. 4s. 6d.

KAY, JOSEPH, Free Trade in Land. Edited by his WIDOW. With Preface by Right Hon. JOHN BRIGHT. Seventh Edition. Cr. 8vo. 5s. Cheap Edition. Cloth, 1s. 6d. ; paper covers, 1s.

KEATS, JOHN, Poetical Works. Edited by W. T. ARNOLD. Large Cr. 8vo. choicely printed on hand-made paper, with etched portrait, vellum, 15s. ; parchment or cloth, 12s. Cheap edition, crown 8vo. cloth, 3s. 6d.

- KEBLE, J., Christian Year.** With Portrait. Elzevir 8vo. vellum, 7s. 6d.; parchment or cloth, 6s. (*Parchment Library.*) New and Cheap Edition, 2s. 6d.
- KELKE, W. H. H., An Epitome of English Grammar.** For the Use of Students. Adapted to London Matriculation Course. Cr. 8vo. 4s. 6d.
- KELLOGG, G. H., Grammar of the Hindi Language.** Second Edition, revised and enlarged. 8vo. 18s.
- KEMPIS, THOMAS A., The Imitation of Christ.** Revised Translation. Elzevir 8vo. (*Parchment Library*), vellum, 7s. 6d.; parchment or cloth, 6s. Red line Edition, fcp. 8vo. 2s. 6d. Cabinet Edition, sm. 8vo. 1s. 6d.; cloth limp, 1s. Miniature Edition, 32mo. with red lines, 1s. 6d.; without red lines, 1s.
- A Metrical Version.** By H. CARRINGTON. Cr. 8vo. 5s.
- De Imitatione Christi.** Latin Text, Rhythmically Arranged, with Translation on Opposite Pages. Cr. 8vo. 7s. 6d.
- KETTLEWELL, S., Thomas à Kempis and the Brothers of Common Life.** With Portrait. Cr. 8vo. 7s. 6d.
- KHAYYĀM, OMAR, The Quatrains of.** Persian Text, with an English Verse Translation. Post 8vo. 10s. 6d. Translation only, 5s. (*Trübner's Oriental Series.*)
- KINAHAN, G. H., Valleys and their Relation to Fissures, Fractures, and Faults.** Cr. 8vo. 7s. 6d.
- KING, Mrs. HAMILTON, The Disciples.** Eleventh Edition. Elzevir 8vo. 6s. Fourteenth Edition. Sm. 8vo. 5s.
- A Book of Dreams.** Third Edition. Cr. 8vo. 3s. 6d.
- Sermon in the Hospital** (from 'The Disciples'). Fifth Edition. Fcp. 8vo. 1s. Cheap Edition, 3d.
- Ballads of the North, and other Poems.** Cr. 8vo. 5s.
- KINGSFORD, ANNA, The Perfect Way in Diet: a Treatise advocating a Return to the Natural and Ancient Food of our Race.** Sixth Edition. Sm. 8vo. 2s.
- Spiritual Hermeneutics of Astrology and Holy Writ.** Illustrated, 4to. parchment, 10s. 6d.
- KINGSFORD, ANNA, and MAITLAND, EDWARD, The Virgin of the World of Hermes Mercurius Trismegistus, rendered into English.** 4to. limit. parchment, 10s. 6d.
- KINGSFORD, W., History of Canada.** 7 vols. 8vo. 15s. each.
- KISTNA, OTTO, Buddha and His Doctrines: a Bibliographical Essay.** 4to. 2s. 6d.
- KNIGHT-BRUCE, Mrs. WYNDHAM, The Story of an African Chief—Khama.** Fourth Edition. 16mo. 2s.
- KNOWLES, J. HINTON, Folk-Tales of Kashmir.** Post 8vo. 16s. (*Trübner's Oriental Series.*)
- KNOX, A. A., The New Playground; or, Wanderings in Algeria.** New and Cheaper Edition. Large cr. 8vo. 6s.
- KOFLER, LEO, Take Care of Your Voice; or, the Golden Rule of Health.** Cr. 8vo. paper, 1s. 6d.
- The Art of Breathing as the Basis of Tone-production.** Third Edition. Cr. 8vo. 10s. 6d.
- KOLBE, F. W., A Language-Study based on Bantu: an Inquiry into the Laws of Root-formation.** 8vo. 6s.
- KRAMER, J., Pocket Dictionary of the Dutch Language.** Fifth Edition. 16mo. 4s.
- KRAPF, L., Dictionary of the Suahili Language.** 8vo. 30s.
- KRAUS, J., Carlsbad: its Thermal Springs and Baths, and how to use them.** Fourth Edition, revised and enlarged. Cr. 8vo. 6s. 6d.
- KUNZ, G. F., Gems and Precious Stones of North America.** Illustrated with 8 Coloured Plates and numerous Engravings. Super-royal 8vo. £2. 12s. 6d.

- LAGRANGE, F., Physiology of Bodily Exercise.** Second Edition. Cr. 8vo. 5s. (J.S.S.)
- LANDON, JOSEPH, School Management;** including a General View of the Work of Education, Organisation, and Discipline. Seventh Edition. Cr. 8vo. 6s. (*Education Library*.)
- LANE, E. W., Selections from the Koran.** New Edition, with Introduction by STANLEY LANE-POOLE. Post 8vo. 9s. (*Trübner's Oriental Series*.)
- LANG, ANDREW, In the Wrong Paradise, and other Stories.** Cr. 8vo. 6s.
Ballades in Blue China. Elzevir 8vo. 5s.
Rhymes à la Mode. With Frontispiece. Fourth Edition. Elzevir 8vo. 5s.
Lost Leaders. Cr. 8vo. 5s. Second Edition.
- LANGE, Prof. F. A., History of Materialism, and Criticism of its present importance.** Authorised Translation by ERNEST C. THOMAS. Fourth Edition. 3 vols. Post 8vo. 10s. 6d. each. (*Philosophical Library*.)
- LANGE, F. K. W., Germania: a German Reading-book.** Part I. Anthology of Prose and Poetry, with vocabulary. Part II. Essays on German History and Institutions. 8vo. 2 vols. 5s. 6d.; separately, 3s. 6d. each.
- LANGSTROTH on the Hive and Honey Bee.** Revised and Enlarged Edition. With numerous Illustrations. 8vo. 9s.
- LARMOYER, M. de, Practical French Grammar.** Cr. 8vo. New Edition, in one vol. 3s. 6d. Two Parts, 2s. 6d. each.
- LARSEN, A., Dano-Norwegian Dictionary.** Cr. 8vo. 10s. 6d.
- Laud (Archbishop), Life of.** By a Romish Recusant. 8vo. 15s.
- LAURIE, S. S., Rise and Early Constitution of Universities.** With a Survey of Mediæval Education. Cr. 8vo. 6s.
- LEE, MATTHEW HENRY, Diaries and Letters of Philip Henry, M.A., of Broad Oak, Flintshire.** Cr. 8vo. 7s. 6d.
- LEECH, H. J., The Life of Mr. Gladstone: told by Himself in Speeches and Public Letters.** Cr. 8vo. 3s. 6d.
- LEFEVRE, ANDRÉ, Race and Language.** Cr. 8vo. 5s. (J.S.S.)
- LEFEVRE, Right Hon. G. SHAW, Peel and O'Connell.** 8vo. 10s. 6d.
Incidents of Coercion: a Journal of Visits to Ireland. Third Edition. Cr. 8vo. limp cloth, 1s. 6d.; paper covers, 1s.
Irish Members and English Gaolers. Cr. 8vo. limp cloth, 1s. 6d.; paper covers, 1s.
Combination and Coercion in Ireland: Sequel to 'Incidents of Coercion.' Cr. 8vo. cloth, 1s. 6d.; paper covers, 1s.
- LEFFMANN, HENRY, and BEAM, W., Examination of Water for Sanitary and Technical Purposes.** Second Edition, revised and enlarged. With Illustrations. Cr. 8vo. 5s.
Analysis of Milk and Milk Products. Cr. 8vo. 5s.
- Legend of Maandoo, The: a Poem.** With Fifteen Collotype Plates. Second Edition. 8vo. 10s. 6d.
- LEGGE, J., Chinese Classics.** Translated into English. Popular Edition. Cr. 8vo.
 Vol. I. Life and Teachings of Confucius. 6th edition, 10s. 6d.
 Vol. II. Works of Mencius, 12s.
 Vol. III. She-King, or Book of Poetry, 12s.
- LEHMANN, K. B., Methods of Practical Hygiene.** Translated by W. CROOKES, 2 vols. 8vo. £1. 11s. 6d.

LELAND, C. G., Breitmann Ballads. The only Authorised Edition. Including Nineteen Original Ballads, illustrating his Travels in Europe. Cr. 8vo. 6s. Cheap Edition, 3s. 6d. (*Lotos Series*.)

Gaudeamus: Humorous Poems from the German of JOSEPH VICTOR SCHEFFEL and others. 16mo. 3s. 6d.

English Gipsies and their Language. New and Cheaper Edition. Cr. 8vo. 3s. 6d.

Fu-Sang; or, The Discovery of America by Chinese Buddhist Priests in the 5th Century. Cr. 8vo. 7s. 6d.

Pidgin-English Sing-Song; or, Songs and Stories in the China-English Dialect. Third Edition. Cr. 8vo. 5s.

The Gipsies. Cr. 8vo. 10s. 6d.

LÉPICIER, ALEXIUS W. (D.D.), Indulgences: Their Origin, Nature, and Development. Post 8vo. 10s. 6d.

LESLEY, J. P., Man's Origin and Destiny. Sketches from the Platform of the Physical Sciences. Second Edition. Cr. 8vo. 7s. 6d.

LESSING, GOTTHOLD E., Education of the Human Race. From the German by F. W. Robertson. Fcp. 8vo. 2s. 6d.

LEVI, Prof. LEONE, International Law, with Materials for a Code of International Law. Cr. 8vo. 5s. (*I.S.S.*)

LEWES, GEORGE HENRY, Problems of Life and Mind. 8vo.

Series I. Foundations of a Creed. 2 vols. 28s.

Series III. The Study of Psychology. 2 vols. 22s. 6d.

The Physical Basis of Mind. With Illustrations. New Edition, with Prefatory Note by Prof. J. SULLY. Large post 8vo. 10s. 6d.

Life's Greatest Possibility: an Essay on Spiritual Realism. Second Edition. Fcp. 8vo. 2s. 6d.

Light on the Path. For the Personal Use of those who are Ignorant of the Eastern Wisdom. Written down by M. C. Fcp. 8vo. 1s. net.

LILLIE, ARTHUR, Popular Life of Buddha. Containing an Answer to the Hibbert Lectures of 1881. With Illustrations. Cr. 8vo. 6s.

Buddhism in Christendom; or, Jesus the Essene. With Illustrations. 8vo. 15s.

LILLY, W. S., Characteristics from the Writings of Cardinal Newman. Selections from his various Works. Ninth Edition. With Portrait. Cr. 8vo. 6s.

LINDSAY, LADY, The King's Last Vigil. Elzevir 8vo. 5s.

LINTON, W. J., Rare Poems of the 16th and 17th Centuries. Cr. 8vo. 5s.

LINTON, W. J., and STODDARD, R. H., English Verse. CHAUCER TO BURNS—TRANSLATIONS—LYRICS OF THE NINETEENTH CENTURY—DRAMATIC SCENES AND CHARACTERS—BALLADS AND ROMANCES. 5 vols. Cr. 8vo. 5s. each.

LLOY, DIODATO, The Philosophy of Right, with special reference to the Principles and Development of Law. Translated from the Italian by W. HASTIE, B.D. 2 vols. Post 8vo. 21s. (*Philosophical Library*.)

LOCHER, CARL, Explanation of Organ Stops. With Hints for Effective Combinations. 8vo. 5s.

LOCKER, F., London Lyrics. Twelfth Edition. With Portrait. Elzevir 8vo. 5s.

LOCKYER, J. NORMAN, Studies in Spectrum Analysis. With 6 Photographic Illustrations of Spectra, and numerous Engravings on Wood. Fourth Edition. Cr. 8vo. 6s. 6d. (*I.S.S.*)

- LOMMEL, Dr. EUGENE, Nature of Light.** With a General Account of Physical Optics. With 188 Illustrations and a Table of Spectra in Chromo-lithography. Fifth Edition. Cr. 8vo. 5s. (*J.S.S.*)
- LONG, J., Eastern Proverbs and Emblems, illustrating Old Truths.** Post 8vo. 6s. (*Trübner's Oriental Series.*)
- LONGFELLOW. Life of H. Wadsworth Longfellow.** By HIS BROTHER. With Portraits and Illustrations. 3 vols. 8vo. 42s.
- LONSDALE, MARGARET, Sister Dora: a Biography.** With Portrait. Thirtieth Edition. Small 8vo. 2s. 6d.
- LOVAT, Lady, Seeds and Sheaves: Thoughts for Incurables.** Cr. 8vo. 5s.
- LOWDER. Charles Lowder: a Biography.** By the Author of 'St. Teresa.' Twelfth Edition. With Portrait. Cr. 8vo. 3s. 6d.
- LOWE, R. W., Thomas Betterton.** Cr. 8vo. 2s. 6d. (*Eminent Actors.*)
- LOWELL, JAMES RUSSELL, Biglow Papers.** Edited by THOMAS HUGHES, Q.C. Fcp. 8vo. 2s. 6d.
- LUBBOCK, Sir JOHN, Ants, Bees, and Wasps: a Record of Observations on the Habits of the Social Hymenoptera.** With 5 Chromo-lithographic Plates. Tenth Edition. Cr. 8vo. 5s. (*J.S.S.*)
- On the Senses, Instincts, and Intelligence of Animals.** With Special Reference to Insects. With 118 Illustrations. Third Edition. Cr. 8vo. 5s. (*J.S.S.*)
- A Contribution to our Knowledge of Seedlings.** With nearly 700 figures in text. 2 vols. 8vo. 36s. net.
- LÜCKES, EVA C. E., Lectures on General Nursing,** Delivered to the Probationers of the London Hospital Training School for Nurses. Fourth Edition. Cr. 8vo. 2s. 6d.
- LUKIN, J., Amateur Mechanics' Workshop: Plain and Concise Directions for the Manipulation of Wood and Metals.** Sixth Edition. Numerous Woodcuts. 8vo. 6s.
- The Lathe and its Uses: or, Instruction in the Art of Turning Wood and Metal.** Seventh Edition. Illustrated. 8vo. 10s. 6d.
- Amongst Machines: a Description of Various Mechanical Appliances Used in the Manufacture of Wood, Metal, &c.** A Book for Boys. Third Edition. With 64 Engravings. Cr. 8vo. 3s. 6d.
- The Boy Engineers: What They Did, and How They Did It.** A Book for Boys. With 30 Engravings. Third Edition. Imp. 16mo. 3s. 6d.
- The Young Mechanic: a Book for Boys.** Containing Directions for the Use of all Kinds of Tools, and for the Construction of Steam-engines and Mechanical Models, including the Art of Turning in Wood and Metal. Seventh Edition. With 70 Engravings. Cr. 8vo. 3s. 6d.
- LUYS, J., The Brain and its Functions.** With Illustrations. Third Edition. Cr. 8vo. 5s. (*J.S.S.*)
- LYALL, Sir ALFRED, Verses written in India.** Second Edition. Elzevir 8vo. gilt top, 5s.
- LYTTON, Earl of, Life, Letters, and Literary Remains of Edward Bulwer, Lord Lytton.** With Portraits, Illustrations, and Facsimiles. 8vo. 2 vols. 32s.
- MACAULAY'S Essays on Men and Books: Lord Clive, Milton, Earl of Chatham, Lord Byron.** Edited by ALEX. H. JAPP. Pott 8vo. 3s. 6d. (*Lotus Series.*)
- MACDONALD, GEORGE, Malcolm.** With Portrait of the Author engraved on Steel. Cr. 8vo. 6s. New and cheaper Edition, 3s. 6d.
- Castle Warlock.** With Frontispiece. Cr. 8vo. 6s. New and cheaper Edition, 3s. 6d.
- There and Back.** With Frontispiece. 6s. New and cheaper Edition, 3s. 6d.
- Donal Grant.** With Frontispiece. Cr. 8vo. 6s. New and cheaper Edition, 3s. 6d.
- Home Again.** With Frontispiece. Cr. 8vo. 6s. New and cheaper Edition, 3s. 6d.
- The Marquis of Lossie.** With Frontispiece. Cr. 8vo. 6s. New and cheaper Edition, 3s. 6d.

- MACDONALD, GEORGE, St. George and St. Michael.** With Frontispiece. Cr. 8vo. 6s. New and cheaper Edition, 3s. 6d.
- What's Mine's Mine.** With Frontispiece. Cr. 8vo. 6s. New and cheaper Edition, 3s. 6d.
- Annals of a Quiet Neighbourhood.** With Frontispiece. Cr. 8vo. 6s. New and cheaper Edition, 3s. 6d.
- The Seaboard Parish : a Sequel to 'Annals of a Quiet Neighbourhood.'** With Frontispiece. Cr. 8vo. 6s. New and cheaper Edition, 3s. 6d.
- Wilfrid Cumbermede : an Autobiographical Story.** With Frontispiece. Cr. 8vo. 6s. New and cheaper Edition, 3s. 6d.
- Thomas Wingfold, Curate.** With Frontispiece. Cr. 8vo. 6s. New and cheaper Edition, 3s. 6d.
- Paul Faber, Surgeon.** With Frontispiece. Cr. 8vo. 6s. New and cheaper Edition, 3s. 6d.
- The Elect Lady.** With Frontispiece. Cr. 8vo. 6s. New and cheaper Edition, 3s. 6d.
- Flight of the Shadow.** With Frontispiece. Cr. 8vo. 6s. New and cheaper Edition, 3s. 6d.
- MAGRATH, TERENCE, Pictures from Ireland.** New Edition. Cr. 8vo. 2s.
- MACHIAVELLI, NICCOLÒ, Discourses on the First Decade of Titus Livius.** From the Italian by N. HILL THOMPSON. Large cr. 8vo. 12s.
- MACKAY, ERIC, A Lover's Litanies, and other Poems.** With Portrait of Author. 3s. 6d. (*Lotos Series.*)
- MAC KENNA, S. J., Plucky Fellows : a Book for Boys.** With 6 Illustrations. Fifth Edition. Cr. 8vo. 3s. 6d.
- MACKONCHIE, Alexander Heriot Mackonochie : a Memoir.** By E. A. T. Edited, with Preface, by E. F. RUSSELL. With Portrait and Views. Large cr. 8vo. 7s. 6d. Cheap Edition, cr. 8vo. 3s. 6d.
- MACRITCHIE, DAVID, Fians, Fairies and Piets.** With Illustrations. Large post 8vo. 7s. 6d.
- MADAN, FALCONER, Books in Manuscript.** With 8 Plates. Post 8vo. 6s. net. (*Books about Books.*)
- MADDEN, F. W., Coins of the Jews ; being a History of the Jewish Coinage and Money in the Old and New Testaments.** With 279 Woodcuts and a Plate of Alphabets. Roy. 4to. £2. 2s.
- The Numismata Orientalia. Vol. II. Coins of the Jews. Being a History of the Jewish Coinage and Money in the Old and New Testaments.** With 279 Woodcuts and Plate. Royal 4to. £2.
- MAGNUS, Lady, About the Jews since Bible times.** Sm. Cr. 8vo. 6s.
- MAGNUS, Sir PHILIP, Industrial Education.** Cr. 8vo. 6s. (*Education Library.*)
- MAGUIRE, W. R., Domestic Sanitary Drainage and Plumbing.** 8vo. 12s.
- MAHAFFY, Prof., Old Greek Education.** Second Edition. Cr. 8vo. 3s. 6d. (*Education Library.*)
- MAIMONIDES, Guide of the Perplexed.** Translated and annotated by M. FRIEDLÄNDER. 3 vols. post 8vo. 31s. 6d. (*Philosophical Library.*)
- MAISEY, Gen. F. C., Sanchi and its Remains.** With Introductory Note by Maj.-Gen. Sir ALEX. CUNNINGHAM, K.C.I.E. With 40 Plates. Royal 4to. £2. 10s.
- MALET, LUCAS, Little Peter : a Christmas Morality for Children of any Age.** With numerous Illustrations. Fourth Thousand. Imp. 16mo. 5s.
- Colonel Enderby's Wife.** With Frontispiece. Cr. 8vo. 6s.
- A Counsel of Perfection.** With Frontispiece. Cr. 8vo. 6s.
- MALLET, Right Hon. Sir LOUIS, Free Exchange.** Papers on Political and Economical Subjects, including Chapters on the Law of Value and Unearned Increment. Edited by BERNARD MALLET. 8vo. 12s.

- MANNING. Towards Evening :** Selections from the Writings of CARDINAL MANNING. Fifth Edition. With Facsimile. 16mo. 2s.
- Many Voices.** Extracts from Religious Writers of Christendom from the 1st to the 16th Century. With Biographical Sketches. Cr. 8vo. 6s.
- MARCHANT, W. T., In Praise of Ale :** Songs, Ballads, Epigrams, and Anecdotes. Cr. 8vo. 10s. 6d.
- MAREY, Prof. E. J., Animal Mechanism :** a Treatise on Terrestrial and Aërial Locomotion. With 117 Illustrations. Third Edition. Cr. 8vo. 5s. (*I.S.S.*)
- MARKHAM, Capt. ALBERT HASTINGS, R.N., The Great Frozen Sea :** a Personal Narrative of the Voyage of the *Alert* during the Arctic Expedition of 1875-6. With Illustrations and Maps. Sixth and Cheaper Edition. Cr. 8vo. 6s.
- MARSDEN, WILLIAM, Numismata Orientalia Illustrata.** 57 Plates of Oriental Coins, from the Collection of the late WILLIAM MARSDEN, F.R.S., engraved from drawings made under his directions. 4to. 31s. 6d.
- MARTIN, G. A., The Family Horse :** its Stabling, Care, and Feeding. Cr. 8vo. 3s. 6d.
- MARTINEAU, GERTRUDE, Outline Lessons on Morals.** Sm. cr. 8vo. 3s. 6d.
- MARTINEAU, HARRIET, The Positive Philosophy of Auguste Comte.** Translated and condensed. New and cheaper Edition. 2 vols. Largepost 8vo. 15s.
- MARTINEAU, JAMES, Essays, Philosophical and Theological.** 2 vols. cr. 8vo. £1. 4s.
- MASON, CHARLOTTE M., Home Education :** a Course of Lectures to Ladies. Second and Revised Edition. Cr. 8vo. 5s.
- MASON, Capt. F. H., Life and Public Service of James A. Garfield, President U.S.A.** With a Preface by BRET HARTE. Portrait. Cr. 8vo. 2s. 6d.
- MATHER, G., and BLAGG, C. J., Bishop Rawle :** a Memoir. Large cr. 8vo. 7s. 6d.
- MATHERS, S. L. M., The Key of Solomon the King.** Translated from ancient MSS. in the British Museum. With Plates. Cr. 4to. 25s.
- The Kabbalah Unveiled.** Containing the Three Books of the Zohar, translated from the Chaldee and Hebrew Text. Post 8vo. 10s. 6d.
- The Tarot :** its Occult Signification, use in Fortune-telling, and method of Play. With pack of 78 Tarot Cards, 5s. ; without the Cards, 1s. 6d.
- MAUDSLEY, H., Body and Will :** an Essay concerning Will, in its Metaphysical, Physiological, and Pathological Aspects. 8vo. 12s.
- Natural Causes and Supernatural Seemings.** Second Edition. Cr. 8vo. 6s.
- Responsibility in Mental Disease.** Fourth Edition. Cr. 8vo. 5s. (*I.S.S.*)
- MAXWELL, W. E., Manual of the Malay Language.** Second Edition. Cr. 8vo. 7s. 6d.
- MEAD, C. M., D.D., Supernatural Revelation :** an Essay concerning the basis of the Christian Faith. Royal 8vo. 14s.
- MEAKIN, J. E. BUDGETT, Introduction to the Arable of Morocco.** English-Arabic Vocabulary, Grammar, Notes, &c. Fcp. 8vo. 6s.
- Meditations on Death and Eternity.** Translated from the German by FREDERICA ROWAN. Published by Her Majesty's gracious permission. Cr. 8vo. 6s.
- Meditations on Life and its Religious Duties.** Translated from the German by FREDERICA ROWAN. Published by Her Majesty's gracious permission. Cr. 8vo. 6s.

- MENDELSSOHN'S** Letters to Ignaz and Charlotte Moscheles. Translated by FELIX MOSCHELES. Numerous Illustrations and Facsimiles. 8vo. 12s.
- MERRILL, G. P.**, Stones for Building and Decoration. Royal 8vo. 21s.
- METCHNIKOFF, ELIAS**, Lectures on the Comparative Pathology of Inflammation. Translated by F. A. and E. H. STARLING. 8vo. 12s.
- MEYER, G. HERMANN von**, Organs of Speech and their Application in the Formation of Articulate Sounds. With 47 Illustrations. Cr. 8vo. 5s. (*I.S.S.*)
- MEYNELL, WILFRID**, John Henry Newman, the Founder of Modern Anglicanism, and a Cardinal of the Roman Church. Cr. 8vo. 2s. 6d.
- MILL, JOHN STUART**, Auguste Comte and Positivism. Fourth Edition. Post 8vo. 3s. 6d. (*Philosophical Library.*)
- MILLER, ELLEN E.**, Alone Through Syria. With Introduction by Prof. A. H. SAYCE. With 8 Illustrations. Second Edition. Cr. 8vo. 5s.
- MILLHOUSE, JOHN**, Italian Dictionary. 2 vols. 8vo. 12s.
- Manual of Italian Conversation. 18mo. 2s.
- MILLS, HERBERT**, Poverty and the State; or, Work for the Unemployed. Cheap edition, limp cloth, 1s. 6d.; paper covers, 1s.
- MILNE, J.**, Earthquakes and other Earth Movements. With 38 Figures. Third and Revised Edition. Cr. 8vo. 5s. (*I.S.S.*)
- MILTON, JOHN**, Prose Writings. Edited by E. MYERS. Elzevir 8vo. vellum, 7s. 6d.; parchment or cloth, 6s. (*Parchment Library.*)
- Poetical Works. 2 vols. elzevir 8vo. vellum, 15s.; parchment or cloth, 12s. (*Parchment Library.*)
- Sonnets. Edited by MARK PATTISON. With Portrait. Elzevir 8vo. vellum, 7s. 6d.; parchment or cloth, 6s. (*Parchment Library.*)
- MITCHELL, LUCY M.**, History of Ancient Sculpture. With Numerous Illustrations. Super-royal 8vo. 42s.
- MIVART, ST. GEORGE**, On Truth. 8vo. 16s.
- Origin of Human Reason. 8vo. 10s. 6d.
- MOLTKE, Count Von**, Notes of Travel. Cr. 8vo. 2s. 6d.
- MONCEL, Count DU**, The Telephone, the Microphone, and the Phonograph. With 74 Illustrations. 3rd Edition. Sm. 8vo. 5s.
- MONIER-WILLIAMS, Sir M.**, Modern India and the Indians; a Series of Impressions, Notes, and Essays. Fifth Edition. Post 8vo. 14s. (*Trübner's Oriental Series.*)
- MONNIER, LE, ABBÉ LEON**, History of S. Francis of Assisi. With a Preface by Cardinal Vaughan. Demy 8vo. 16s.
- MOORE, AUBREY L.**, Essays, Scientific and Philosophical. With Memoir of the Author. Cr. 8vo. 6s.
- Lectures and Papers on the History of the Reformation in England and on the Continent. 8vo. 16s.
- Science and the Faith: Essays on Apologetic Subjects. Third Edition. Cr. 8vo. 6s.
- MOORE, BLOOMFIELD**, Keely and his Discoveries: Aerial Navigation. Large post 8vo. 10s. 6d.
- MOORE, CUNNINGHAM WILSON**, A Practical Guide for Prospectors, Explorers, and Miners. 8vo. 12s. net.
- MOORE, T. W.**, Treatise and Handbook of Orange Culture in Florida, Louisiana, and California. Fourth Edition Enlarged. 18mo. 5s.
- MORFILL, W. R.**, Simplified Grammar of the Polish Language. Cr. 8vo. 3s. 6d.
- Simplified Serbian Grammar. Crown 8vo. 4s. 6d.

- MORFIT, CAMPBELL, Manufacture of Soaps.** With Illustrations. 8vo. £2. 12s. 6d.
Pure Fertilizers, and the Chemical Conversion of Rock Guanos, &c., into various Valuable Products. With 28 Plates. 8vo. £4. 4s.
- MORISON, J. COTTER, The Service of Man :** an Essay towards the Religion of the Future. Cr. 8vo. 5s.
- MORRIS. Diary and Letters of Gouverneur Morris**, Minister of the U.S. to France. With Portraits. 2 vols. 8vo. 30s.
- MORRIS, HENRY, Simplified Grammar of the Telugu Language.** With Map of India showing Telugu Country. Cr. 8vo. 10s. 6d.
- MORRIS, MARTIN, Life's Greatest Possibility :** an Essay on Spiritual Realism. Second Edition. Fcp. 8vo. 2s. 6d.
- MORSE, E. S., First Book of Zoology.** With numerous Illustrations. New Edition. Cr. 8vo. 2s. 6d.
- MORSELLI, Prof. H., Suicide :** an Essay on Comparative Moral Statistics. Second Edition, with Diagrams. Cr. 8vo. 5s. (*J.S.S.*)
- MOSENTHAL, J. De, and HARTING, JAMES E., Ostriches and Ostrich Farming.** Second Edition. With 8 full-page Illustrations and 20 woodcuts, royal 8vo. 10s. 6d.
- MUIR, JOHN, Original Sanskrit Texts**, on the Origin and History of the People of India. 5 vols. 8vo.
Mythical and Legendary Accounts of the Origin of Caste. Third Edition. £1. 1s. Also issued as a volume of *Trübner's Oriental Series*, at the same price.
The Trans-Himalayan Origin of the Hindus. Second Edition. £1. 1s.
- MUR, JOHN, The Vedas.** Second Edition. 16s.
Comparison of the Vedic with the Principal Indian Deities. Second Edition. £1. 1s.
Cosmogony, Mythology, &c., of the Indians in the Vedic Age. Third Edition. £1. 1s.
Metrical Translations from Sanskrit Writers. Post 8vo. 14s. (*Trübner's Oriental Series.*)
- MULHALL, M. G. & E. T., Handbook of the River Plate**, comprising the Argentine Republic, Uruguay, and Paraguay. With Railway Map. Sixth Edition. Cr. 8vo. 6s.
- MULHOLLAND, ROSA, Marcella Grace :** an Irish Novel. Cr. 8vo. 6s.
A Fair Emigrant. With Frontispiece. Cr. 8vo. 6s.
- MÜLLER, E., Simplified Grammar of the Pali Language.** Cr. 8vo. 7s. 6d.
- MÜLLER, F. MAX, Outline Dictionary**, for the Use of Missionaries, Explorers, and Students of Language. 12mo. morocco, 7s. 6d.
Sacred Hymns of the Brahmins, as preserved in the oldest Collection of Religious Poetry, the Rig-Veda-Sanhita. Vol. I. Hymns to the Maruts, or the Storm-Gods. 8vo. 12s. 6d.
Hymns of the Rig-Veda, in the Sanhita and Pada Texts. 2 vols. Second Edition. 8vo. £1. 1s.
- Munchausen's Travels and Surprising Adventures.** Illustrated by ALFRED CROWQUILL. 3s. 6d. (*Lotos Series.*)
- My Lawyer ;** or, the People's Legal Adviser. A Concise Abridgement of and Popular Guide to the Laws of England. By a BARRISTER-AT-LAW. New and cheaper Edition. Cr. 8vo. 3s. 6d.
- NARADIYA DHARMA-SASTRA ;** or, The Institutes of Narada. Translated by Dr. JULIUS JOLLY. Cr. 8vo. 10s. 6d.
- NEWHOUSE, S., Trapper's Guide ;** a Manual of Instructions for Capturing all Kinds of Fur-bearing Animals, and Curing their Skins, &c. Eighth, Revised Edition. 8vo. 5s.

NEWMAN. *Characteristics from the Writings of Cardinal Newman.* Selections from his various Works, arranged by W. S. LILLY. Ninth Edition. With Portrait. Cr. 8vo. 6s.

*. * Portrait of the late Cardinal Newman, mounted for framing, 2s. 6d.

NEWMAN, F. W., *Miscellanies.* 8vo. Vol. I., Chiefly Addresses, Academical and Historical, 7s. 6d.

A Handbook of Modern Arabic. Post 8vo. 6s.

NICOLS, ARTHUR, *Chapters from the Physical History of the Earth: an Introduction to Geology and Palæontology.* With numerous Illustrations. Cr. 8vo. 5s.

NILSSON, L. G., WIDMARK, P. F., and COLLIN, A. Z., *Swedish Dictionary.* New Edition. 8vo. 16s.

NOEL, Hon. RODEN, *A Modern Faust, and other Poems.* Sm. cr. 8vo. 5s.

Essays on Poetry and Poets. 8vo. 12s.

NOIRIT, JULES, *French Course in Ten Lessons.* Cr. 8vo. 1s. 6d.

French Grammatical Questions, for the use of Gentlemen preparing for the Army, Civil Service, Oxford Examinations, &c. Cr. 8vo. 1s.; interleaved, 1s. 6d.

NORTHALL, G. F., *English Folk Rhymes.* A Collection of Traditional Verses relating to Places and Persons, Customs, Superstitions, &c. Cr. 8vo. 10s. 6d.

Notes on Cavalry Tactics, Organisation, &c. By a CAVALRY OFFICER. With Diagrams. 8vo. 12s.

NUGENT'S French Pocket Dictionary. 24mo. 3s.

Numismata Orientalia (The), Royal 4to. in Paper Wrapper. Part I. Ancient Indian Weights, by E. THOMAS, with a Plate and Map, 9s. 6d. Part II. Coins of the Urtuki Turkumans, by S. LANE POOLE, with 6 Plates, 9s. Part III. Coinage of Lydia and Persia, by BARCLAY V. HEAD, with 3 Plates, 10s. 6d. Part IV. Coins of the Tuluni Dynasty, by E. T. ROGERS, with 1 Plate, 5s. Part V. Parthian Coinage, by PERCY GARDNER, with 8 Plates, 18s. Part VI. Ancient Coins and Measures of Ceylon, by T. W. RHYS DAVIDS, with 1 Plate, 10s.

Vol. I. containing Six Parts, as specified above, half-bound, £3. 13s. 6d.

Vol. II. *Coins of the Jews:* being a History of the Jewish Coinage in the Old and New Testaments. By F. W. MADDEN. With 279 Woodcuts and Plate. Royal 4to. £2.

Vol. III. Part I. *The Coins of Arakan, of Pegu, and of Burma.* By Lieut.-General Sir ARTHUR PHAYRE. Also contains the Indian Balhara, and the Arabian Intercourse with India in the Ninth and following Centuries. By EDWARD THOMAS. With 5 Illustrations. Royal 4to. 8s. 6d.

Vol. III. Part II. *The Coins of Southern India.* By Sir W. ELLIOT. With Map and Plates. Royal 4to. 25s.

NUNN, T. W., *Growing Children and Awkward Walking.* Cr. 8vo. 2s.

OATES, FRANK, *Matabele Land and the Victoria Falls: a Naturalist's Wanderings in the Interior of South Africa.* Edited by C. G. OATES. With numerous Illustrations and 4 Maps. Second Edition. 8vo. 21s.

O'BRIEN, R. BARRY, *Irish Wrongs and English Remedies, with other Essays.* Cr. 8vo. 5s.

Home Ruler's Manual. Cr. 8vo. cloth, 1s. 6d.; paper covers, 1s.

Life and Letters of Thomas Drummond, Under-Secretary in Ireland, 1835-40. 8vo. 14s.

O'CLERY, The, *The Making of Italy, 1856-70.* With Sketch Maps. 8vo. 16s.

O'CONNELL, Mrs. MORGAN J., *The Last Colonel of the Irish Brigade, Count O'Connell, and Old Irish Life at Home and Abroad, 1745-1833.* 2 vols. 8vo. 25s.

- O'CONNOR, EVANGELINE**, Index to Shakspeare's Works. Cr. 8vo. 5s.
- O'HAGAN, JOHN**, Joan of Arc: an Historical Essay. Cr. 8vo. 3s. 6d.
- OLCOTT, Colonel**, Posthumous Humanity: a Study of Phantoms, from the French of Adolphe D'Assier. With Appendix and Notes. Cr. 8vo. 7s. 6d.
- Theosophy, Religion, and Occult Science**, with Glossary of Eastern words. Cr. 8vo. 7s. 6d.
- OLLENDORFF**, Metodo para aprender a Leer, escribir y hablar el Inglés, segun el sistema de Ollendorff. 8vo. 4s. 6d. Key, 4s.
- Metodo para aprender a Leer, escribir y hablar el Frances, segun el sistema de Ollendorff**. Cr. 8vo. 6s. Key, 3s. 6d.
- OMAN, F. G.**, Swedish Dictionary. Cr. 8vo. 8s.
- O'NEARA, KATHLEEN**, Henri Perreyve and his Counsels to the Sick. Sm. cr. 8vo. 5s.
- One-and-a-Half in Norway**. By EITHER and BOTH. Sm. cr. 8vo. 3s. 6d.
- OSMASTON, FRANCIS P.**, Dramatic Monologues. Cr. 8vo. 3s. 6d.
- OTTÉ E. C.**, Dano-Norwegian Grammar: a Manual for Students of Danish, based on the Ollendorffian System. Third Edition. Cr. 8vo. 7s. 6d. Key, 3s.
- Simplified Grammar of the Danish Language**. Cr. 8vo. 2s. 6d.
- Simplified Grammar of the Swedish Language**. Cr. 8vo. 2s. 6d.
- OWEN, ROBERT DALE**, Footfalls on the Boundary of another World. With Narrative Illustrations. Post 8vo. 7s. 6d.
- Debatable Land between this World and the Next**. With Illustrative Narrations. Second Edition. Cr. 8vo. 7s. 6d.
- Threading My Way: Twenty-seven Years' of Autobiography**. Cr. 8vo. 7s. 6d.
- PACKARD, A. S.**, The Labrador Coast. A Journal of two Summer Cruises to that Region. With Maps and Illustrations. 8vo. 18s.
- PALGRAVE, W. GIFFORD**, Hermann Agha: an Eastern Narrative. Third Edition. Cr. 8vo. 6s.
- PALMER, E. H.**, English-Persian Dictionary. With Simplified Grammar of the Persian Language. Royal 16mo. 10s. 6d.
- Persian-English Dictionary**. Second Edition. Royal 16mo. 10s. 6d.
- Simplified Grammar of Hindustani, Persian, and Arabic**. Second Edition. Cr. 8vo. 5s.
- Papers relating to Indo-China**. Reprinted from Dalrymple's 'Oriental Repertory,' 'Asiatic Researches,' and the 'Journal' of the Asiatic Society of Bengal. Post 8vo. 2 vols. 21s.
- MISCELLANEOUS ESSAYS ON SUBJECTS CONNECTED WITH THE MALAY PENINSULA AND THE INDIAN ARCHIPELAGO**. From the Journals of the Royal Asiatic, Royal Geographical Societies, &c. Edited by R. ROST. With 5 Plates and a Map. Second Series, 2 vols. 25s. (*Trübner's Oriental Series*.)
- PARAVICINI, FRANCES de**, Early History of Balliol College. 8vo. 12s.
- PARKER, G. W.**, Concise Grammar of the Malagasy Language. Cr. 8vo. 5s.
- PARKER, THEODORE**, Discourse on Matters pertaining to Religion. People's Edition. Cr. 8vo. cloth, 2s. ; paper covers, 1s. 6d.
- Collected Works of Theodore Parker**, Minister of the Twenty-eighth Congregational Society at Boston, U.S. 14 vols. Cr. 8vo. 6s. each.
- PARKES, SIR HENRY**, Sonnets and other Verse. Elzevir 8vo. 2s. 6d.
- PARRY, C. HUBERT H.**, The Art of Music. Second Edition. 8vo. 12s.
- PARRY, EDWARD ABBOTT**, Charles Macklin. Cr. 8vo. 2s. 6d. (*Eminent Actors*.)
- PARSLOE, JOSEPH**, Our Railways: Sketches, Historical and Descriptive. With Information as to Fares and Rates, &c. Cr. 8vo. 6s.

- PASCAL, BLAISE**, *Thoughts*. Translated by C. KEGAN PAUL. Large cr. 8vo. Parchment, 12s.; vellum, 15s. Cheap edition. Cr. 8vo. 6s.
- PASTOR, Dr. LUDWIG**, *The History of the Popes*. Translated from the German by FREDERICK J. ANTROBUS. Volumes 3 and 4. 8vo. 24s. net.
- PATON, A. A.**, *History of the Egyptian Revolution*, from the Period of the Mamelukes to the Death of Mohammed Ali. Second Edition. 2 vols. 8vo. 7s. 6d.
- PAUL, ALEXANDER**, *Short Parliaments*. History of National Demand for Frequent General Elections. Sm. cr. 8vo. 3s. 6d.
- PAUL, C. KEGAN**, *Faith and Unfaith*, and other Essays. Cr. 8vo. 7s. 6d.
- Thoughts of Blaise Pascal*. Translated. Large cr. 8vo. Parchment, 12s.; vellum, 15s. Cheap Edition, cr. 8vo. 6s.
- Paul of Tarsus**. By the Author of 'Rabbi Jeshua.' Cr. 8vo. 4s. 6d.
- PEARSON, SAMUEL**, *Scholars of Christ*. Cr. 8vo. 6s.
- Week-Day Living*. Third Edition. Cr. 8vo. 6s.
- PENBERTON, T. EDGAR**, *Charles Dickens and the Stage: a Record of his Connection with the Drama*. Cr. 8vo. 6s.
- PERRY, ARTHUR LATHAM**, *Principles of Political Economy*. Large post 8vo. 9s.
- PESCHEL, OSCAR**, *The Races of Man and their Geographical Distribution*. Second Edition. Large cr. 8vo. 9s.
- PETTIGREW, J. B.**, *Animal Locomotion; or, Walking, Swimming, and Flying*. With 130 Illustrations. Third Edition. Cr. 8vo. 5s. (*I.S.S.*)
- PHAYRE, Lieut.-Gen. Sir A.**, *History of Burma*. Including Burma Proper, Pegu, Taungu, Tenasserim, and Arakan, from the Earliest Time to the end of the First War with British India. Post 8vo. 14s. (*Trübner's Oriental Series.*)
- PHAYRE, Lieut.-Gen. Sir A.**, and **THOMAS, E.**, *Coins of Arakan, of Pegu, and of Burma*. With 5 Illustrations. Royal 4to. 8s. 6d. (*Numismata Orientalia.*)
- PHILLIPS, Col. A. N.**, *Hindustani Idioms*. With Vocabulary and Explanatory Notes. Cr. 8vo. 5s.
- PHILLIPS, W.**, *Manual of British Discomycetes*. With Descriptions of all the Species of Fungi hitherto found in Britain included in the Family, and Illustrations of the Genera. Cr. 8vo. 5s. (*I.S.S.*)
- 'PHYSICUS'**, *Candid Examination of Theism*. Third Edition. Post 8vo. 7s. 6d. (*Philosophical Library.*)
- PICARD, A.**, *Pocket Dictionary of the Dutch Language*. Fifth Edition. 16mo. 10s.
- PICKFORD, JOHN**, *Maha-vira-Charita; or, the Adventures of the Great Hero Rama*. From the Sanskrit of BHAVABHÜTI. Cr. 8vo. 5s.
- PILCHER, J. E.**, *First Aid in Illness and Injury*. With 174 Illustrations. Cr. 8vo. 6s.
- PLOWRIGHT, C. B.**, *British Uredineæ and Ustilagineæ*. With Illustrations. 8vo. 12s.
- PLUMPTRE, C. J.**, *Lectures on Elocution*, delivered at King's College. Fourth Edition. Post 8vo. 15s.
- POE, EDGAR ALLAN**, *Poems*. Edited by ANDREW LANG. With Frontispiece. Elzevir 8vo. vellum, 7s. 6d.; parchment or cloth, 6s. (*Parchment Library.*)
- The Raven*. With Commentary by JOHN H. INGRAM. Cr. 8vo. parchment, 6s.

- POETS ON POETS.** Edited by MRS. RICHARD STRACHEY. Elzevir 8vo. vellum, 7s. 6d.; parchment or cloth, 6s. (*Parchment Library.*)
- POLE, W., Philosophy of Music.** Lectures delivered at the Royal Institution. Fourth Edition. Post 8vo. 7s. 6d. (*Philosophical Library.*)
- POLLARD, A. W., Early Illustrated Books.** With Plates. Post 8vo. 6s. net. (*Books about Books.*)
- POLLEN, JOHN, Rhymes from the Russian.** Translations from the best Russian Poets. Cr. 8vo. 3s. 6d.
- PONSARD, F., Charlotte Corday: a Tragedy.** Edited by Professor C. CASSAL. Fourth Edition. 12mo. 2s. 6d.
- L'Honneur et l'Argent: a Comedy.** Edited by Professor C. CASSAL. Fourth Edition. 12mo. 3s. 6d.
- PONTOPIDDAN, HENRIK, The Apothecary's Daughters.** Translated from the Danish by GORDIUS NIELSEN. Cr. 8vo. 3s. 6d.
- POOLE, STANLEY LANE, The Numismata Orientalia.** Part II. Coins of the Urtuki Turkumans. With 6 Plates. Royal 4to. Paper wrapper, 9s.
- POOLE, W. F., Index to Periodical Literature.** Revised Edition. Royal 8vo. £3. 13s. 6d. net. FIRST SUPPLEMENT, 1882 to 1887. Royal 8vo. £2 net. SECOND SUPPLEMENT, 1887 to 1892. Royal 8vo. £2 net.
- POSNETT, H. M., Comparative Literature.** Crown 8vo. 5s. (*I.S.S.*)
- POULTON, E. B., Colours of Animals: their Meaning and Use, especially considered in the case of Insects.** With Coloured Frontispiece and 66 Illustrations in Text. Cr. 8vo. 5s. (*I.S.S.*)
- Practical Guides,** to see all that ought to be seen in the shortest period and at the least expense. 113th Thousand, Illustrated. Sm. 8vo. paper covers. France, Belgium, Holland, and the Rhine, 1s. Italian Lakes, 1s. Wintering Places of the South, 2s. Switzerland, Savoy, and North Italy, 2s. 6d. General Continental Guide, 5s. Geneva, 1s. Paris, 1s. Bernese Oberland, 1s. Italy, 4s.
- PRATT, GEORGE, Grammar and Dictionary of the Samoan Language.** Second Edition. Cr. 8vo. 18s.
- PRATT, Lieut.-Colonel S. C., Field Artillery: its Equipment, Organisation, and Tactics.** Fourth Edition. Sm. cr. 8vo. 6s. (*Military Handbooks.*)
- Military Law: its Procedure and Practice.** Tenth revised Edition. Sm. cr. 8vo. 4s. 6d. net. (*Military Handbooks.*)
- PREL, CARL DU, Philosophy of Mysticism.** Translated from the German by C. C. MASSEY. 2 vols. 8vo. cloth, 25s.
- PRICE, Prof. BONAMY, Chapters on Practical Political Economy.** New Edition. Cr. 8vo. 5s.
- PRIG, The Prigment: 'The Life of a Prig,' 'Prig's Bede,' 'How to Make a Saint,' 'Black is White.'** Second Edition. In 1 vol. Cr. 8vo. 5s.
- A Romance of the Recusants.** Cr. 8vo. 5s.
- Black is White; or, Continuity Continued.** Second Edition. Fcp. 8vo. 3s. 6d.
- Prig's Bede: the Venerable Bede Expurgated, Expounded, and Exposed.** Second Edition. Fcp. 8vo. 3s. 6d.
- Riches or Ruin.** Fcp. 8vo. 3s. 6d.
- Egosophy.** Fcp. 8vo. 3s. 6d.
- PRIOR, MATTHEW, Selected Poems.** Edited by AUSTIN DOBSON. Elzevir 8vo. vellum, 7s. 6d.; parchment or cloth, 6s. (*Parchment Library.*)
- PROTHERO, G. W., Henry Bradshaw: a Memoir, with Portrait and Facsimile** 8vo. 16s.
- Psalms of the West.** Second Edition. Sm. 8vo. 1s. 6d.

Pulpit Commentary, The (Old Testament Series). Edited by the Very Rev. Dean H. D. M. SPENCE, D.D., and the Rev. J. S. EXELL. Super royal 8vo.

Genesis, by the Rev. T. WHITELAW, D.D.; Homilies by the Very Rev. J. F. MONTGOMERY, D.D., Rev. Prof. R. A. REDFORD, Rev. F. HASTINGS, Rev. W. ROBERTS; Introduction to the Study of the Old Testament, by Ven. Archdeacon FARRAR, D.D.; Introductions to the Pentateuch, by the Right Rev. H. COTTERILL, D.D., and Rev. T. WHITELAW, D.D. Ninth Edition. 15s.

Exodus, by the Rev. Canon RAWLINSON; Homilies by the Rev. J. ORR, D.D., Rev. D. YOUNG, Rev. C. A. GOODHART, Rev. J. URQUHART, and the Rev. H. T. ROBJOHN. Fifth Edition. 2 vols. 9s. each.

Leviticus, by the Rev. Prebendary MEYRICK; Introductions by the Rev. R. COLLINS, Rev. Professor A. CAVE; Homilies by the Rev. Prof. REDFORD, Rev. J. A. MACDONALD, Rev. W. CLARKSON, Rev. S. R. ALDRIDGE, and Rev. MCCHEYNE EDGAR. Fifth Edition. 15s.

Numbers, by the Rev. R. WINTERBOTHAM; Homilies by the Rev. Prof. W. BINNIE, D.D., Rev. E. S. PROUT, Rev. D. YOUNG, Rev. J. WAITE; Introduction by the Rev. THOMAS WHITELAW, D.D. Fifth Edition. 15s.

Deuteronomy, by the Rev. W. L. ALEXANDER, D.D.; Homilies by the Rev. C. CLEMANCE, D.D., Rev. J. ORR, D.D., Rev. R. M. EDGAR, Rev. J. D. DAVIES. Fourth Edition. 15s.

Joshua, by the Rev. J. J. LIAS; Homilies by the Rev. S. R. ALDRIDGE, Rev. R. GLOVER, Rev. E. DE PRESSENSÉ, D.D., Rev. J. WAITE, Rev. W. F. ADENEY; Introduction by the Rev. A. PLUMMER, D.D. Sixth Edition. 12s. 6d.

Judges and Ruth, by the Bishop of BATH and WELLS, and Rev. J. MORISON, D.D.; Homilies by the Rev. A. F. MUIR, Rev. W. F. ADENEY, Rev. W. M. STATHAM, and Rev. Prof. J. THOMSON. Fifth Edition. 10s. 6d.

1 and 2 Samuel, by the Very Rev. R. PAYNE SMITH, D.D.; Homilies by the Rev. DONALD FRASER, D.D., Rev. Prof. CHAPMAN, Rev. B. DALE, and Rev. G. WOOD. Seventh Edition. 2 vols. 15s. each.

1 Kings, by the Rev. JOSEPH HAMMOND; Homilies by the Rev. E. DE PRESSENSÉ, D.D., Rev. J. WAITE, Rev. A. ROWLAND, Rev. J. A. MACDONALD, and Rev. J. URQUHART. Fifth Edition. 15s.

Kings, by the Rev. Canon RAWLINSON; Homilies by the Rev. J. ORR, D.D., Rev. D. THOMAS, D.D., and Rev. C. H. IRWIN. Second Edition. 15s.

1 Chronicles, by the Rev. Prof. P. C. BARKER; Homilies by the Rev. Prof. J. R. THOMSON, Rev. R. TUCK, Rev. W. CLARKSON, Rev. F. WHITFIELD, and Rev. RICHARD GLOVER. Second Edition. 15s.

2 Chronicles, by the Rev. PHILIP C. BARKER; Homilies by the Rev. W. CLARKSON and Rev. T. WHITELAW, D.D. Second Edition. 15s.

Ezra, Nehemiah, and Esther, by the Rev. Canon G. RAWLINSON; Homilies, by the Rev. Prof. J. R. THOMSON, Rev. Prof. R. A. REDFORD, Rev. W. S. LEWIS, Rev. J. A. MACDONALD, Rev. A. MACKENNAL, Rev. W. CLARKSON, Rev. F. HASTINGS, Rev. W. DINWIDDIE, Rev. Prof. ROWLANDS, Rev. G. WOOD, Rev. Prof. P. C. BARKER, and the Rev. J. S. EXELL. Seventh Edition. 12s. 6d.

Job, by the Rev. Canon G. RAWLINSON. Homilies by the Rev. T. WHITELAW, D.D., the Rev. Prof. E. JOHNSON, the Rev. Prof. W. F. ADENEY, and the Rev. R. GREEN. 21s.

Psalms, by Rev. Canon G. RAWLINSON. Homilies by Rev. E. R. CONDER, D.D., Rev. W. CLARKSON, Rev. C. CLEMANCE, D.D., Rev. W. FORSYTH, D.D., Rev. C. SHORT, D.D., Rev. S. CONWAY, and Rev. R. TUCK.

Proverbs, by the Rev. W. J. DEANE and the Rev. S. T. TAYLOR-TASWELL. Homilies by the Rev. Prof. W. F. ADENEY, the Rev. Prof. E. JOHNSON, and the Rev. W. CLARKSON. Second Edition. 15s.

Ecclesiastes and Song of Solomon, by the Rev. W. J. DEANE and Rev. Prof. R. A. REDFORD. Homilies by the Rev. T. WHITELAW, D.D., Rev. B. C. CAFFIN, Rev. Prof. J. R. THOMSON, Rev. S. CONWAY, Rev. D. DAVIES, Rev. W. CLARKSON, and Rev. J. WILLCOCK. 21s.

Pulpit Commentary, (The Old Testament Series)—

Isaiah, by the Rev. Canon G. RAWLINSON; Homilies by the Rev. Prof. E. JOHNSON, Rev. W. CLARKSON, Rev. W. M. STATHAM, and Rev. R. TUCK. Third Edition. 2 vols. 15s. each.

Jeremiah and Lamentations, by the Rev. Canon T. K. CHEYNE, D.D.; Homilies by the Rev. Prof. J. R. THOMSON, Rev. W. F. ADENEY, Rev. A. F. MUIR, Rev. S. CONWAY, Rev. D. YOUNG, Rev. J. WAITE. 2 vols. Fourth Edition. 15s. each.

Ezekiel, by the Very Rev. E. H. PLUMPTRE, D.D. Homilies by the Rev. Prof. W. F. ADENEY, the Rev. Prof. J. R. THOMSON, the Rev. J. D. DAVIES, the Rev. W. JONES, and the Rev. W. CLARKSON. Introduction by the Rev. T. WHITE-LAW, D.D. 2 vols. 12s. 6d. each.

Daniel, by Rev. J. E. H. THOMSON, B.D. Homilies by Rev. Professor W. F. ADENEY, Rev. H. T. ROJOHNS, and Rev. J. D. DAVIES.

Hosea and Joel, by the Rev. Prof. J. J. GIVEN, D.D.; Homilies by the Rev. Prof. J. R. THOMSON, Rev. A. ROWLAND, Rev. C. JERDAN, Rev. J. ORR, D.D., and Rev. D. THOMAS, D.D. Second Edition. 15s.

Amos, Obadiah, Jonah, and Micah, by the Rev. W. J. DEANE; Homilies by the Rev. J. EDGAR HENRY, Rev. Prof. J. R. THOMSON, Rev. S. D. HILLMAN, Rev. A. ROWLAND, Rev. D. THOMAS, Rev. A. C. THISELTON, Rev. E. S. PROUT, Rev. G. T. COSTER, Rev. W. G. BLAIKIE. 15s.

Nahum, by the Rev. W. J. DEANE. Homilies, by the Rev. T. WHITELAW, Rev. S. D. HILLMAN, and the Rev. D. THOMAS. 15s.

Pulpit Commentary, The (New Testament Series). Edited by the Very Rev. H. D. M. SPENCE, D.D., and Rev. JOSEPH S. EXELL.

St. Matthew, by the Rev. A. L. WILLIAMS. Homilies by the Rev. B. C. CAFFIN, Rev. Prof. W. F. ADENEY, Rev. P. C. BARKER, Rev. M. DODS, D.D., Rev. J. A. MACDONALD, and Rev. R. TUCK. 2 vols. 21s. each.

St. Mark, by the Very Rev. Dean E. BICKERSTETH, D.D.; Homilies by the Rev. Prof. J. R. THOMSON, Rev. Prof. J. J. GIVEN, D.D., Rev. Prof. E. JOHNSON, Rev. A. ROWLAND, Rev. A. F. MUIR, and Rev. R. GREEN. Sixth Edition. 2 vols. 10s. 6d. each.

St. Luke, by the Very Rev. Dean H. D. M. SPENCE; Homilies by the Rev. J. MARSHALL LANG, D.D., Rev. W. CLARKSON, and Rev. R. M. EDGAR. Second Edition. 2 vols. 10s. 6d. each.

St. John, by the Rev. Prof. H. R. REYNOLDS, D.D.; Homilies by the Rev. Prof. T. CROSKERY, D.D., Rev. Prof. J. R. THOMSON, Rev. D. YOUNG, Rev. B. THOMAS, and Rev. G. BROWN. Third Edition. 2 vols. 15s. each.

The Acts of the Apostles, by the Right Rev. Bishop of BATH and WELLS; Homilies by the Rev. Prof. P. C. BARKER, Rev. Prof. E. JOHNSON, Rev. Prof. R. A. REDFORD, Rev. R. TUCK, Rev. W. CLARKSON. Fifth Edition. 2 vols. 10s. 6d. each.

Romans, by the Rev. J. BARMBY; Homilies by Rev. Prof. J. R. THOMSON, Rev. C. H. IRWIN, Rev. T. F. LOCKYER, Rev. S. R. ALDRIDGE, and Rev. R. M. EDGAR. 15s.

Corinthians and Galatians, by the Ven. Archdeacon FARRAR, D.D., and Rev. Prebendary E. HUXTABLE; Homilies by the Rev. Ex-Chancellor LIPSCOMB, Rev. DAVID THOMAS, D.D., Rev. DONALD FRASER, D.D., Rev. R. TUCK, Rev. E. HURNDALL, Rev. Prof. J. R. THOMSON, Rev. R. FINLAYSON, Rev. W. F. ADENEY, Rev. R. M. EDGAR, and Rev. T. CROSKERY, D.D. 2 vols. Vol. I., containing I. Corinthians, Fifth Edition, 15s. Vol. II., containing Corinthians and Galatians, Second Edition, 21s.

Ephesians, Philippians, and Colossians, by the Rev. Prof. W. G. BLAIKIE, D.D., Rev. B. C. CAFFIN, and Rev. G. G. FINDLAY; Homilies by the Rev. D. THOMAS, D.D., Rev. R. M. EDGAR, Rev. R. FINLAYSON, Rev. W. F. ADENEY, Rev. Prof. T. CROSKERY, D.D., Rev. E. S. PROUT, Rev. Canon VERNON HUTTON, and Rev. U. R. THOMAS, D.D. Third Edition. 21s.

Pulpit Commentary, The (New Testament Series)—

Thessalonians, Timothy, Titus, and Philemon, by the Right Rev. Bishop of BATH and WELLS, Rev. Dr. GLOAG, and Rev. Dr. EAZES; Homilies by the Rev. B. C. CAFFIN, Rev. R. FINLAYSON, Rev. Prof. T. CROSKERY, D.D., Rev. W. F. ADENEY, Rev. W. M. STATHAM, and Rev. D. THOMAS, D.D. Second Edition. 15s.

Hebrews and James, by the Rev. J. BARMBY, and Rev. Prebendary E. C. S. GIBSON; Homilies by the Rev. C. JERDAN and Rev. Prebendary E. C. S. GIBSON, Rev. W. JONES, Rev. C. NEW, Rev. D. YOUNG, Rev. J. S. BRIGHT, and Rev. T. F. LOCKYER. Third Edition. 15s.

Peter, John, and Jude, by the Rev. B. C. CAFFIN, Rev. A. PLUMMER, D.D., and Rev. Prof. S. D. F. SALMOND, D.D.; Homilies by the Rev. A. MACLAREN, D.D., Rev. C. CLEMANCE, D.D., Rev. Prof. J. R. THOMSON, Rev. C. NEW, Rev. U. R. THOMAS, Rev. R. FINLAYSON, Rev. W. JONES, Rev. Prof. T. CROSKERY, D.D., and Rev. J. S. BRIGHT, D.D. Second Edition. 15s.

Revelation. Introduction by the Rev. T. RANDELL, principal of Bede College, Durham. Exposition by the Rev. A. PLUMMER, D.D., assisted by Rev. T. RANDELL and A. T. BOTT. Homilies by the Rev. C. CLEMANCE, D.D., Rev. S. CONWAY, Rev. R. GREEN, and Rev. D. THOMAS, D.D. Second Edition. 15s.

PURITZ, LUDWIG, *Code Book of Gymnastic Exercises*. 32mo. 1s. 6d. net.

PUSEY, *Sermons for the Church's Seasons from Advent to Trinity*. Selected from the published Sermons of the late EDWARD BOUVERIE PUSEY, D.D. Cr. 8vo. 5s.

PYE, W., *Surgical Handicraft: a Manual of Surgical Manipulations, &c.* With 235 illustrations. Third Edition, Revised and Edited by T. H. R. CROWLE. Cr. 8vo. 10s. 6d.

Elementary Bandaging and Surgical Dressing, for the use of Dressers and Nurses. Twelfth Thousand. 18mo. 2s.

Public Schools (Our): Eton, Harrow, Winchester, Rugby, Westminster, Marlborough, and The Charterhouse. Cr. 8vo. 6s.

QUATREFAGES, Prof. A. de, *The Human Species*. Fifth Edition. Cr. 8vo. 5s. (*J.S.S.*)

QUINCEY, DE, *Confessions of an English Opium Eater*. Edited by RICHARD GARNETT. Elzevir 8vo. vellum, 7s. 6d.; parchment or cloth, 6s. (*Parchment Library.*)

RALSTON, W. R. S., *Tibetan Tales*, derived from Indian Sources. Done into English from the German of F. ANTON VON SCHIEFNER. Post 8vo. 14s. (*Trübner's Oriental Series.*)

Rare Poems of the 16th and 17th Centuries. Edited by W. J. LINTON. Cr. 8vo. 5s.

RASK, ERASMUS, *Grammar of the Anglo-Saxon Tongue*. From the Danish, by B. THORPE. Third Edition. Post 8vo, 5s. 6d.

READE, WINWOOD, *The Martyrdom of Man*. Fourteenth Edition. Cr. 8vo. 7s. 6d.

REAGAN, H. C., *Locomotive Mechanism and Engineering*. Cr. 8vo. 10s.

REANEY, Mrs. G. S., *Waking and Working; or, From Girlhood to Womanhood*. New and Cheaper Edition, with Frontispiece. Cr. 8vo. 3s. 6d.

Blessing and Blessed: a Sketch of Girl Life. New and Cheaper Edition. Cr. 8vo. 3s. 6d.

Rose Gurney's Discovery: a Story for Girls, dedicated to their Mothers. Cr. 8vo. 3s. 6d.

- REANEY, Mrs. G. S., English Girls : their Place and Power.** With Preface by the Rev. R. W. DALR. Fifth Edition. Fcp. 8vo. 2s. 6d.
- Just Anyone,** and other Stories. With 3 Illustrations. 16mo. 1s. 6d.
- Sunbeam Willie,** and other Stories. With 3 Illustrations. 16mo. 1s. 6d.
- Sunshine Jenny,** and other Stories. With 3 Illustrations. 16mo. 1s. 6d.
- REDHOUSE, J. W., Simplified Grammar of the Ottoman-Turkish Language.** Cr. 8vo. 10s. 6d.
- Turkish Vade-Mecum of Ottoman Colloquial Language.** English-Turkish and Turkish-English, the whole in English Characters, the Pronunciation being fully indicated. Third Edition. 32mo. 6s.
- The Mesnevi** (usually known as the Mesneviyi Sherif, or Holy Mesnevi) of Mevlânâ (Our Lord) Jelâlu'd-Din Muhammed Er-Rûmi. Illustrated by a selection of Characteristic Anecdotes. Post 8vo. £1. 1s. (*Trübner's Oriental Series.*)
- History, System, and Varieties of Turkish Poetry.** Illustrated by Selections in the original English Paraphrase. 8vo. 2s. 6d.
- Tentative Chronological Synopsis of the History of Arabia and its Neighbours,** from B.C. 500,000 (?) to A.D. 679. 8vo. 2s.
- REES, J. D., H.R.H. The Duke of Clarence and Avondale in Southern India.** With a Narrative of Elephant Catching in Mysore, by G. P. SANDERSON. With Map, Portraits, and Illustrations. Medium 8vo. 31s. 6d.
- Lord Connemara's Tears in India, 1896-1890.** 8vo. 15s.
- RENAN, ERNEST, Age and Antiquity of the Book of Nabathæan Agriculture.** Cr. 8vo. 3s. 6d.
- Life of Jesus.** Cr. 8vo. 1s. 6d. ; paper covers, 1s.
- The Apostles.** Cr. 8vo. 1s. 6d. ; paper covers, 1s.
- RENDELL, J. M., Handbook of the Island of Madeira.** With Plan and Map. Second Edition. Fcp. 8vo. 1s. 6d.
- REYNOLDS, J. W., The Supernatural in Nature : a Verification by Free Use of Science.** Third Edition, Revised and Enlarged. 8vo. 14s.
- Mystery of the Universe our Common Faith.** 8vo. 14s.
- Mystery of Miracles.** Third Edition, Enlarged. Cr. 8vo. 6s.
- The World to Come : Immortality a Physical Fact.** Cr. 8vo. 6s.
- REYNOLDS, Sir JOSHUA, Discourses.** Edited by E. GOSSE. Elzevir 8vo. vellum, 7s. 6d. ; parchment or cloth, 6s. (*Parchment Library.*)
- RIBOT, Prof. Th., Diseases of Memory : an Essay in the Positive Psychology.** Third Edition. Cr. 8vo. 5s. (*J.S.S.*)
- Heredity : a Psychological Study of its Phenomena, Laws, Causes, and Consequences.** Second Edition. Large cr. 8vo. 9s.
- English Psychology.** Cr. 8vo. 7s. 6d.
- RICHARDSON, AUSTIN, 'What are the Catholic Claims ?'** With Introduction by Rev. LUKE RIVINGTON. Cr. 8vo. 3s. 6d.
- RICHARDSON, M. T., Practical Blacksmithing.** With 400 Illustrations. 4 vols. Cr. 8vo. 5s. each.
- Practical Horse-shoer.** With 170 Illustrations. Cr. 8vo. 5s.
- Practical Carriage-Building.** 2 vols. 10s.
- RICHTER, Prof. VICTOR von, Text-book of Inorganic Chemistry.** Authorised Translation. By EDGAR F. SMITH. Third American Edition, from the Fifth German Edition. Cr. 8vo. 8s. 6d.
- Chemistry of the Carbon Compounds ; or, Organic Chemistry.** Authorised Translation. By EDGAR F. SMITH. Second American Edition, from the Sixth German Edition. Cr. 8vo. 20s.
- RIEHL, Dr. A., Introduction to the Theory of Science and Metaphysics.** Translated by Dr. ARTHUR FAIRBANKS. Post 8vo. 9s. (*Philosophical Library.*)

- RIOLA, HENRY**, *How to learn Russian* : a Manual for Students. Based upon the Ollendorffian System. Fourth Edition. Cr. 8vo. 12s. Key, 5s.
Russian Reader. With Vocabulary. Cr. 8vo. 10s. 6d.
- RIVINGTON, LUKE**, *Authority* ; or, *A Plain Reason for Joining the Church of Rome.* Sixth Edition. Cr. 8vo. 3s. 6d.
Dependence ; or, *The Insecurity of the Anglican Position.* Cr. 8vo. 5s.
The English Martyrs. Sewed, 6d.
The Church Visible. Sewed, 6d.
The Appeal to History : a Letter to the Bishop of Lincoln. Sewed, 6d.
- ROBERTS, C.**, *An English-Zulu Dictionary.* Cr. 8vo. 5s. net.
The Zulu-Kafir Language. Cr. 8vo. 6s. net.
- ROBERTS, H.**, *Grammar of the Khassi Language.* Cr. 8vo. 10s. 6d.
- ROBERTSON, F. W.**, *Life and Letters.* Edited by STOFFORD BROOKE.
 I. Library Edition. With Portrait. 8vo. 12s.
 II. Two vols. With Portrait. Cr. 8vo. 7s. 6d.
 III. Popular Edition. Cr. 8vo. 6s.
Sermons. 5 vols. Sm. 8vo. 3s. 6d. each.
Notes on Genesis. New and Cheaper Edition. Sm. 8vo. 3s. 6d.
St. Paul's Epistles to the Corinthians : Expository Lectures. New Edition. Sm. 8vo. 5s.
Lectures and Addresses. With other Literary Remains. New Edition. Sm. 8vo. 5s.
Analysis of Tennyson's 'In Memoriam.' Dedicated by Permission to the Poet-Laureate. Fcp. 8vo. 2s.
Education of the Human Race. Translated from the German of GOTTHOLD EPHRAIM LESSING. Fcp. 8vo. 2s. 6d.
 . Portrait of the late Rev. F. W. Robertson, mounted for framing, 2s. 6d.
- ROBERTSON, J. D.**, *Conscience, A New Analysis of.* Vol. I. 8vo. 7s. 6d.
- ROBINSON, A. MARY F.**, *The Fortunate Lovers.* Twenty-seven Novels of the Queen of Navarre. Frontispiece by G. P. JACOMB HOOD. Large cr. 8vo. 10s. 6d.
The Crowned Hippolytus. Sm. cr. 8vo. 5s.
- ROBINSON, W. PEART**, *Burning Questions.* Second Edition. Cr. 8vo. paper, 1s.
- ROCHE, A.**, *French Grammar.* Adopted by the Imperial Council of Public Instruction. Cr. 8vo. 3s.
- Prose and Poetry*, from English Authors. For Reading, Composition, and Translation. Second Edition. Fcp. 8vo. 2s. 6d.
- ROCKHILL, W. W.**, *Life of the Buddha and the Early History of his Order.* Derived from Tibetan Works in the Bkah-Hgyur and the Bstan-Hgyur. Post 8vo. 10s. 6d. (*Trübner's Oriental Series.*)
- UDANAVARGA** : a Collection of Verses from the Buddhist Canon. Compiled by DHARMATRĀTA and Translated from the Tibetan. Post 8vo. 9s. (*Trübner's Oriental Series.*)
- RODD, E. H.**, *Birds of Cornwall and the Scilly Islands.* Edited by J. E. HARTING. With Portrait and Map. 8vo. 14s.
- ROGERS, E. T.**, *The Numismata Orientalia.* Part IV. The Coins of the Tuluni Dynasty. With 1 Plate. Royal 4to. Paper wrapper, 5s.
- ROGERS, WILLIAM**, *Reminiscences.* Compiled by R. H. HADDEN. With Portrait. Cr. 8vo. 6s. ; Cheap Edition, 2s. 6d.
- ROMANES, G. J.**, *Mental Evolution in Animals.* With Posthumous Essay on Instinct by CHARLES DARWIN. 8vo. 12s.
Mental Evolution in Man : Origin of the Human Faculty. 8vo. 14s.
Animal Intelligence. Fourth Edition. Cr. 8vo. 5s. (*J.S.S.*)
Jelly-Fish, Star-Fish, and Sea-Urchins : being a Research on Primitive Nervous Systems. With Illustrations. Second Edition. Cr. 8vo. 5s. (*J.S.S.*)

- ROOD, OGDEN N., Colour :** a Text-book of Modern Chromatics. With Applications to Art and Industry. With 130 Original Illustrations. Third Edition. Cr. 8vo. 5s. (*I.S.S.*)
- ROOT, A. I., The A B C of Bee Culture.** A Cyclopædia of everything pertaining to the care of the Honey Bee. Illustrated. Royal 8vo. 6s. 6d.
- ROOSEVELT, THEODORE, Hunting Trips of a Ranchman.** With 26 Illustrations. Royal 8vo. 18s.
- ROSENTHAL, Prof. J., General Physiology of Muscles and Nerves.** Third Edition. With 75 Illustrations. Cr. 8vo. 5s. (*I.S.S.*)
- ROSING, S., Danish Dictionary.** Cr. 8vo. 8s. 6d.
- ROSS, Lieut.-Col. W. A., Pyrology, or Fire Chemistry.** Sm. 4to. 36s.
- ROUTLEDGE, Canon C. F., History of St. Martin's Church, Canterbury.** Cr. 8vo. 5s.
- ROUTLEDGE, JAMES, English Rule and Native Opinion in India.** 8vo. 10s. 6d.
- RULE, MARTIN, Life and Times of St. Anselm, Archbishop of Canterbury and Primate of the Britains.** 2 vols. 8vo. 32s.
- ST. CLAIR, GEORGE, Buried Cities and Bible Countries.** Second Edition. Large cr. 8vo. 7s. 6d.
- SAINTSBURY G., Specimens of English Prose Style from Malory to Macaulay.** Selected and Annotated. With Introductory Essay. Large cr. 8vo. Printed on hand-made paper. Vellum, 15s.; parchment antique or cloth, 12s.
- SALAMAN, J. S., Trade Marks : their Registration and Protection.** Cr. 8vo. 5s.
- SALMONÉ, H. A., Arabic-English Dictionary,** comprising about 120,000 Arabic Words, with English Index of about 50,000 Words. 2 vols. post 8vo. 36s.
- SALWAY, CHARLOTTE M., Fans of Japan.** With 10 full-page Coloured Plates and 39 Blocks in Text. Royal 4to. 31s. 6d. net.
- SAMUELSON, F. M., Labour-saving Machinery.** Cr. 8vo. 2s. 6d.
- SAMUELSON, JAMES, Bulgaria, Past and Present : Historical, Political, and Descriptive.** With Map and numerous Illustrations. 8vo. 10s. 6d.
- SANDWITH, F. M., Egypt as a Winter Resort.** Cr. 8vo. 3s. 6d.
- SANTIAGO, DANIEL, Curry Cook's Assistant.** Fcp. 8vo. 1s. 6d.; paper covers, 1s.
- SARGENT, HERBERT H., Napoleon Bonaparte's First Campaign.** With Comments. Cr. 8vo. 6s.
- SAYCE, A. H., Introduction to the Science of Language.** New and Cheaper Edition. 2 vols. cr. 8vo. 9s.
- The Principles of Comparative Philology.** Fourth Edition, revised and enlarged. Cr. 8vo. 10s. 6d.
- SCANNELL, THOMAS B., and WILHELM, JOSEPH, D.D., Manual of Catholic Theology,** based on SCHEEBEN'S 'Dogmatik.' Vol. I. 15s.
- SCHAW, Col. H., Defence and Attack of Positions and Localities.** Fifth Edition. Cr. 8vo. 3s. 6d.
- SCHLAGINTWEIT, EMIL, Buddhism in Tibet.** Illustrated by Literary Documents and Objects of Religious Worship. With 20 Plates. 2 vols. roy. 8vo. and folio, £2. 2s.
- SCHLEICHER, AUGUST, Comparative Grammar of the Indo-European, Sanskrit, Greek, and Latin Languages.** From the Third German Edition by H. BENDALL. 8vo. 13s. 6d.

SCHLEIERMACHER, F. *On Religion : Speeches to its Cultured Despisers.* Translated, with Introduction, by J. OMAN. 8vo. 7s. 6d.

SCHMIDT, Prof. O. *Doctrine of Descent and Darwinism.* With 26 Illustrations. Seventh Edition. Cr. 8vo. 5s. (*I.S.S.*)

Mammalia in their Relation to Primeval Times. With 51 Woodcuts. Cr. 8vo. 5s. (*I.S.S.*)

SCHOOLING, J. HOLT, *Handwriting and Expression : a Study of Written Gesture, with 150 Facsimile Reproductions of the Handwritings of Men and Women of various Nationalities.* Translated. 8vo. 6s.

SCHOPENHAUER, A. *The World as Will and Idea.* From the German by R. B. HALDANE and J. KEMP. Third Edition. 3 vols. post 8vo. £2. 10s. (*Philosophical Library.*)

SCHÜTZENBERGER, Prof., *Fermentation.* With 28 Illustrations. Fourth Edition. Cr. 8vo. 5s. (*I.S.S.*)

SCOONES, W. B. *Four Centuries of English Letters : a Selection of 350 Letters by 150 Writers, from the period of the Paston Letters to the Present Time.* New and cheaper Edition, 5s.

SCOTT, JAMES GEORGE, *Burma as it Was, as it Is, and as it Will Be.* Cheap Edition. Cr. 8vo. 2s. 6d.

SCOTT, ROBERT H. *Elementary Meteorology.* Fifth Edition. With numerous Illustrations. Cr. 8vo. 5s. (*I.S.S.*)

SEDDING, JOHN D. *Gardencraft, Old and New.* With Memorial Notice by the Rev. E. F. RUSSELL. 16 Illustrations. Second Edition. 8vo. 12s.

Art and Handicraft. Six Essays. 8vo. 7s. 6d.

SELBY, H. M. *Shakespeare Classical Dictionary ; or, Mythological Allusions in the Plays of Shakespeare explained.* Fcap. 8vo. 1s.

SEMPER, KARL, *Natural Conditions of Existence as they affect Animal Life.* With 2 Maps and 106 Woodcuts. Fourth Edition. Cr. 8vo. 5s. (*I.S.S.*)

SERJEANT, W. C. ELDON, *The Astrologer's Guide (Anima Astrologiæ).* 8vo. 7s. 6d.

SHAKSPEARE. WORKS. Avon Edition. In One Volume. With Glossarial Index. Super roy. 8vo. 7s. 6d.

Works. Avon Edition. 12 vols. Elzevir 8vo. (*Parchment Library*), vellum, 7s. 6d. per vol. ; parchment or cloth, 6s. per vol. ; Cheap Edition, 1s. 6d. per vol.

. The Cheap Edition may also be had complete, 12 vols. in cloth box, 21s., or bound in 6 vols. 15s.

Works. New Variorum Edition. Edited by HORACE HOWARD FURNESS. Roy. 8vo. Vol. I. *Romeo and Juliet*, 18s. Vol. II. *Macbeth*, 18s. Vols. III. and IV. *Hamlet*, 2 vols. 36s. Vol. V. *King Lear*, 18s. Vol. VI. *Othello*, 18s. Vol. VII. *Merchant of Venice*, 18s. Vol. VIII. *As You Like It*, 18s.

Concordance to Shakspeare's Poems. By Mrs. FURNESS. Roy. 8vo. 18s.

Sonnets. Edited by EDWARD DOWDEN. With Frontispiece. Elzevir 8vo. (*Parchment Library*), vellum, 7s. 6d. ; parchment or cloth, 6s.

SHAW, FLORA L. *Castle Blair : a Story of Youthful Days.* Cr. 8vo. 3s. 6d.

SHAW, Lieut.-Col. WILKINSON, *Elements of Modern Tactics practically applied to English Formations.* Eighth Edition. With 31 Plates and Maps. Small cr. 8vo. 9s. net. (*Military Handbooks.*)

- SHELLEY. Life of P. B. Shelley.** By EDWARD DOWDEN, LL.D. With Portraits. 2 vols. 8vo. 36s.
- Poems.** Edited, with Preface, by RICHARD GARNETT. Frontispiece. Elzevir 8vo. vellum, 7s. 6d.; parchment or cloth, 6s. (*Parchment Library.*)
- Select Letters.** Edited by RICHARD GARNETT. Elzevir 8vo. vellum, 7s. 6d.; parchment or cloth, 6s. (*Parchment Library.*)
- Complete Works.** Centenary Edition. Edited by GEORGE EDWARD WOODBERRY. 4 vols. Cr. 8vo. 24s. net.
- SHORE. Journal of Emily Shore.** With Portrait and Facsimile. Cr. 8vo. 6s.
- SIDGWICK, A., Fallacies :** a View of Logic from the Practical Side. Second Edition. Cr. 8vo. 5s. (*I.S.S.*)
- SIDNEY, Sir PHILIP, Knt., The Countess of Pembroke's Arcadia.** Edited by H. OSKAR SOMMER. The original 4to. Edition (1590) in Photographic Facsimile, with Bibliographical Introduction. £2. 2s.
- SIMCOX, EDITH, Episodes in the Lives of Men, Women, and Lovers.** Cr. 8vo. 7s. 6d.
- Natural Law :** an Essay in Ethics. Second Edition. Post 8vo. 10s. 6d. (*Philosophical Library.*)
- SIME, JAMES, Lessing :** his Life and Writings. Second Edition, with Portraits. 2 vols. Post 8vo. 21s. (*Philosophical Library.*)
- SIMONNÉ, Metodo para aprender a Leer Escribir y hablar el Frances,** segun el verdadero sistema de Ollendorff. Cr. 8vo. 6s. Key, 3s. 6d.
- SIMPSON, M. C. M., Letters and Recollections of Julius and Mary Mehl.** With Portraits and 2 Illustrations. 8vo. 15s.
- SINGER, I., Simplified Grammar of the Hungarian Language.** Cr. 8vo. 4s. 6d.
- SINTRAM, A Northern Drama in Five Acts.** By a Graduate of Balliol. Cr. 8vo. 3s. 6d.
- SINNETT, A. P., The Occult World.** Sixth Edition. Cr. 8vo. 3s. 6d.
- Incidents in the Life of Madame Blavatsky.** With Portrait. 8vo. 10s. 6d.
- SKINNER. James Skinner :** a Memoir. By the Author of 'Charles Lowder.' With Preface by the Rev. Canon CARTER, and Portrait. Large cr. 8vo. 7s. 6d. Cheap Edition, cr. 8vo. 3s. 6d.
- SLATER, J. H., Early Editions.** A Bibliographical Survey of the Works of some Popular Authors. 8vo. 21s. net. Interleaved with Writing Paper, 26s. net.
- SMITH, ARTHUR H., Chinese Characteristics.** Second Edition. Revised with Illustrations. 8vo. 10s. 6d.
- SMITH, E., Foods.** With numerous Illustrations. Ninth Edition. Cr. 8vo. 5s. (*I.S.S.*)
- SMITH, EDGAR F., Electro-Chemical Analysis.** With 25 Illustrations. Square 16mo. 5s.
- SMITH, H. PERCY, Glossary of Terms and Phrases.** Cheap Edition. Medium 8vo. 3s. 6d.
- SMITH, HAMILTON, Hydraulics :** the Flow of Water through Orifices, over Weirs, and through open Conduits and Pipes. With 17 plates. Royal 4to. 30s.
- SMITH, HUNTINGTON, A Century of American Literature :** Benjamin Franklin to James Russell Lowell. Cr. 8vo. 6s.
- SMITH, L. A., The Music of the Waters :** Sailors' Chanties and Working Songs of the Sea. Words and Music. 8vo. 12s.
- SMITH, M., and HORNEMAN, H., Norwegian Grammar.** With a Glossary for Tourists. Post 8vo. 2s.

- SMYTH, R. BROUGH**, *The Aborigines of Victoria*. Compiled for the Government. With Maps, Plates, and Woodcuts. 2 vols. royal 8vo. £3. 3s.
- SOPHOCLES**, *The Seven Plays in English Verse*. Translated by Prof. LEWIS CAMPBELL. Cr. 8vo. 7s. 6d.
- Spanish Mystics**. By the Editor of 'Many Voices.' Cr. 8vo. 5s.
- Specimens of English Prose Style from Malory to Macaulay**. Selected and Annotated. With an Introductory Essay by GEORGE SAINTSBURY. Large cr. 8vo, printed on hand-made paper, vellum, 15s.; parchment antique or cloth, 12s.
- SPENCER, HERBERT**, *Study of Sociology*. Fifteenth Edition. Cr. 8vo. 5s. (I.S.S.)
- SPINNER, ALICE**, *Lucilla : an Experiment*. 2 vols. Cr. 8vo. 12s. net.
- SPINOZA**, *Life, Correspondence, and Ethics of Spinoza*. By R. WILLIS. 8vo. 21s.
- Sporting Stories and Sketches**. By G. G. With frontispiece by G. Bowers. Cr. 8vo. 6s.
- SPRAGUE, CHARLES E.**, *Handbook of Volapuk*, the International Language. Second Edition. Cr. 8vo. 5s.
- STALLO, J. B.**, *Concepts and Theories of Modern Physics*. Third Edition. Cr. 8vo. 5s. (I.S.S.)
- STARCKE, C. N.**, *The Primitive Family in its Origin and Development*. Cr. 8vo. 5s. (I.S.S.)
- STEBBING, T. R. R.**, *The Naturalist of Cumbria : a True Story, being the Life of David Robertson*. Cr. 8vo. 6s.
- A History of Crustacea**. Recent Malacostraca. With numerous Illustrations. Cr. 8vo. 5s. (I.S.S.)
- STEWART, BALFOUR**, *Conservation of Energy*. With 14 Illustrations. Seventh Edition. Cr. 8vo. 5s. (I.S.S.)
- STORR, F., and TURNER, H.**, *Canterbury Chimes ; or, Chaucer Tales Re-told to Children*. With 6 Illustrations from the Ellesmere Manuscript. Third Edition. Fcap. 8vo. 3s. 6d.
- STRACHEY, Sir JOHN**, *India*. With Map. New Edition. Cr. 8vo. 6s.
- STRAHAN, S. A. K.**, *Marriage and Disease*. A Study of Heredity and the more important Family Degenerations. Cr. 8vo. 6s.
- Stray Papers on Education, and Scenes from School Life**. By B. H. Second Edition. Sm. cr. 8vo. 3s. 6d.
- STRECKER, ADOLPH**, *Text-book of Organic Chemistry*. Edited by Prof. WISLICENUS. Translated and Edited, with Extensive Additions, by W. R. HODGKINSON and A. J. GREENAWAY. Second and Cheaper Edition. 8vo. 12s. 6d.
- STREET, J. C.**, *The Hidden Way across the Threshold ; or, The Mystery which hath been Hidden for Ages and from Generations*. With Plates. Large 8vo. 15s.
- STRETTON, HESBA**, *David Lloyd's Last Will*. With 4 Illustrations. New Edition. Royal 16mo, 2s. 6d.
- Through a Needle's Eye ; a Story**. With Frontispiece. Cr. 8vo. 6s.
- SULLY, JAMES**, *Pessimism : a History and a Criticism*. Second Edition. 8vo. 10s. 6d.
- Illusions : a Psychological Study**. Third Edition. Cr. 8vo. 5s. (I.S.S.)
- SWINBURNE, ALGERNON CHARLES**, *A Word for the Navy*. (Only 250 copies printed.) Imperial 16mo. paper covers, 5s.
- SWINBURNE**, *Bibliography of A. C. Swinburne, 1857-87*. Cr. 8vo. vellum gilt, 6s.
- SYMONDS, JOHN ADDINGTON**, *Vagabunduli Libellus*. Cr. 8vo. 6s.

- SWIFT, JON., Letters and Journals.** Edited by STANLEY LANE-POOLE. Elzevir 8vo. vellum, 7s. 6d.; parchment or cloth, 6s. (*Parchment Library.*)
- Prose Writings.** Edited by STANLEY LANE-POOLE. With Portrait. Elzevir 8vo. vellum, 7s. 6d.; parchment or cloth, 6s. (*Parchment Library.*)
- TAFT, L. R., Greenhouse Construction:** a Complete Manual of the Building, Heating, Ventilating, and Arrangement of. Cr. 8vo. 7s. 6d.
- 'TASMA,' A Sydney Sovereign, and other Tales.** Crown 8vo. cloth, 6s.
In her Earliest Youth. Cheap Edition. Cr. 8vo. 6s.
- TAYLOR, Col. MEADOWS, Seeta:** a Novel. With Frontispiece. Cr. 8vo. 6s.
Tippoo Sultaun: a Tale of the Mysore War. With Frontispiece. Cr. 8vo. 6s.
Ralph Darnell. With Frontispiece. Cr. 8vo. 6s.
A Noble Queen. With Frontispiece. Cr. 8vo. 6s.
The Confessions of a Thug. With Frontispiece. Cr. 8vo. 6s.
Tara: a Mahratta Tale. With Frontispiece. Crown 8vo. 6s.
- TAYLOR, Canon ISAAC, The Alphabet:** an Account of the Origin and Development of Letters. With numerous Tables and Facsimiles. 2 vols. 8vo. 36s.
Leaves from an Egyptian Note-Book. Cr. 8vo. 5s.
- TAYLOR, R. WHATELEY COOKE, The Modern Factory System.** 8vo. 14s.
- TAYLOR, Sir H., Works.** 5 vols. Cr. 8vo. 30s.
Phillip Van Artevelde. Fcap. 8vo. 3s. 6d.
The Virgin Widow, &c. Fcap. 8vo. 3s. 6d.
The Statesman. Fcap. 8vo. 3s. 6d.
- Technological Dictionary** of the Terms employed in the Arts and Sciences (Architecture, Engineering, Mechanics, Shipbuilding and Navigation, Metallurgy, Mathematics, &c.), with Preface by KARL KAMARSCH. Fourth Revised Edition. 3 vols. imperial 8vo.
Vol. I. German-English-French. 12s.
Vol. II. English-German-French. 12s.
Vol. III. French-German-English. 15s.
- THACKERAY, S. W., The Land and the Community.** Crown 8vo. 3s. 6d.
- THACKERAY, W. M., Essay on the Genius of George Cruikshank.** Reprinted verbatim from the *Westminster Review*. With 40 Illustrations. Royal 8vo. 7s. 6d.
Sultan Stork, and other Stories and Sketches, 1829-44, now first collected; to which is added the Bibliography of Thackeray. Large 8vo. 10s. 6d.
- THEODOLI, The MARCHESA, Candideuccia:** Scenes from Roman Life. 2 vols. Cr. 8vo. 12s. net.
- THOM, J. HAMILTON, Laws of Life after the Mind of Christ.** Two Series. Fourth Edition. Cr. 8vo. 7s. 6d. each.
- THOMAS, E., The Numismata Orientalia.** Part I. Ancient Indian Weights. With Plate and Map of the India of MANU. Royal 4to. paper wrapper, 9s. 6d.
- THOMPSON, E. MAUNDE, Handbook of Greek and Latin Palæography.** With numerous facsimiles. Cr. 8vo. 5s. (*J.S.S.*)
- THOMPSON, Sir H., Diet in Relation to Age and Activity.** Fcp. 8vo. 1s. 6d.; paper covers, 1s.
Modern Cremation. Second Edition, revised and enlarged. Cr. 8vo. 2s.; paper covers, 1s.
- THRELFALL, EVELYN. Starlight Songs.** Small cr. 8vo. 3s. 6d.
- Through North Wales with a Knapsack.** By FOUR SCHOOLMISTRESSES. With a Sketch Map. Sm. 8vo. 2s. 6d.

- THURSTON, Prof. R. H., History of the Growth of the Steam Engine.** With numerous Illustrations. Fourth Edition. Cr. 8vo. 5s. (*J.S.S.*)
- Manual of the Steam Engine.** For Engineers and Technical Schools. Parts I. and II. Royal 8vo. 31s. 6d. each Part.
- TIELE, Prof. C. P., Outlines of the History of Religion to the Spread of the Universal Religions.** From the Dutch by J. ESTLIN CARPENTER. Fifth Edition. Post 8vo. 7s. 6d. (*Philosophical Library, and Trübner's Oriental Series.*)
- History of the Egyptian and Mesopotamian Religions.** Translated by J. BALLINGAL. Post 8vo. 7s. 6d. (*Trübner's Oriental Series.*)
- TIRARD, H. M. and N., Sketches from a Nile Steamer,** for the use of Travellers in Egypt. With Map and numerous Illustrations. Cr. 8vo. 6s.
- TISDALL, W. ST. CLAIR, Simplified Grammar and Reading Book of the Panjābi Language.** Cr. 8vo. 7s. 6d.
- Simplified Grammar of the Gujaroti Language.** Cr. 8vo. 10s. 6d.
- TOLSTOI, Count LEO, Christ's Christianity.** Translated from the Russian. Large cr. 8vo. 7s. 6d.
- TORCEANU, R., Simplified Grammar of the Roumanian Language.** Cr. 8vo. 5s.
- TORREND, J., Comparative Grammar of the South African Bantu Languages,** comprising those of Zanzibar, Mozambique, the Zambezi, Kafirland, Benguela, Angola, The Congo, The Ogowé, The Cameroons, the Lake Region, &c. Super-royal 8vo. 25s.
- TRAHERNE, Mrs. ARTHUR, The Mill on the Usk.** Cr. 8vo. 6s.
- TRENCH. Letters and Memorials of Archbishop Trench.** By the Author of 'Charles Lowder.' With 2 Portraits. 2 vols. 8vo. 21s.
- TRENCH, Archbishop, English Past and Present.** Fourteenth Edition, revised and improved. Fcp. 8vo. 5s.
- On the Study of Words.** Twenty-third Edition, revised. Fcp. 8vo. 5s.
- Notes on the Parables of Our Lord.** Fifteenth Edition. 8vo. 12s.; Cheap Edition, 61st thousand, 7s. 6d.
- Notes on the Miracles of Our Lord.** Twelfth Edition. 8vo. 12s.; Cheap Edition, Fourteenth Edition, 7s. 6d.
- Household Book of English Poetry.** Fifth Edition, revised. Extra fcp. 8vo. 5s.
- Essay on the Life and Genius of Calderon.** With Translations from his 'Life's a Dream' and 'Great Theatre of the World.' Second Edition, revised and improved. Extra fcp. 8vo. 5s. 6d.
- Gustavus Adolphus in Germany,** and other Lectures on the Thirty Years' War. Fourth Edition, enlarged. Fcp. 8vo. 4s.
- Plutarch: His Life, His Lives, and His Morals.** Second Edition, enlarged. Fcp. 8vo. 3s. 6d.
- Remains of the late Mrs. Richard Trench.** Being Selections from her Journals, Letters, and other Papers. Edited by her Son, Archbishop TRENCH. New and Cheaper Edition. With Portraits. 8vo. 6s.
- Lectures on Mediæval Church History.** Being the substance of Lectures delivered at Queen's College, London. 2nd edition, 8vo. 12s.
- Poems.** Eleventh Edition. Fcp. 8vo. 7s. 6d. Library Edition. 2 vols. sm. 8vo. 10s.
- Proverbs and their Lessons.** Eighth Edition, enlarged. Fcp. 8vo. 4s.
- Select Glossary of English Words used formerly in Senses different from their present.** Seventh Edition, revised and enlarged. Fcp. 8vo. 5s.
- Brief Thoughts and Meditations on some Passages in Holy Scripture.** Third Edition. Cr. 8vo. 3s. 6d.

TRENCH, Archbishop, Commentary on the Epistles to the Seven Churches in Asia. Fifth Edition, revised. 8vo. 8s. 6d.

On the Authorised Version of the New Testament. Second Edition. 8vo. 7s.

Sermons New and Old. Cr. 8vo. 6s.

Westminster and other Sermons. Cr. 8vo. 6s.

The Sermon on the Mount: an Exposition drawn from the Writings of St. Augustine. Fourth Edition, enlarged. 8vo. 10s. 6d.

Shipwrecks of Faith: three Sermons preached before the University of Cambridge. Fcap. 8vo. 2s. 6d.

Studies in the Gospels. Fifth Edition, revised. 8vo. 10s. 6d.

Synonyms of the New Testament. Eleventh Edition, enlarged. 8vo. 12s.

TRENCH, Major-General, Cavalry in Modern War. Sm. cr. 8vo. 6s. (*Military Handbooks.*)

TRIMEN, ROLAND, South African Butterflies: a Monograph of the Extra-tropical Species. With 12 Coloured Plates. 3 vols. 8vo. £2. 12s. 6d.

TROUESSART, E. L., Microbes, Ferments, and Moulds. With 107 Illustrations. Second Edition. Cr. 8vo. 5s. (*I.S.S.*)

TROWBRIDGE, J. M., The Cider Maker's Handbook: a Complete Guide for Making and Keeping Pure Cider. Illustrated. Cr. 8vo. 5s.

TRÜBNER'S Bibliographical Guide to American Literature. From 1817 to 1857. 8vo. half-bound, 18s.

Catalogue of Dictionaries and Grammars of the Principal Languages and Dialects of the World. Second Edition. 8vo. 5s.

TRUMBULL, H. CLAY, The Blood-Covenant: a Primitive Rite and its Bearings on Scripture. Post 8vo. 7s. 6d.

TURBERVILLE, W., The Triumph of Love. Poems. Cr. 8vo. 5s.

TURNER, C. E., Count Tolstoi, as Novelist and Thinker. Lectures delivered at the Royal Institution. Cr. 8vo. 3s. 6d.

Modern Novelists of Russia. Lectures delivered at the Taylor Institution, Oxford. Cr. 8vo. 3s. 6d.

TURTON, Major W. H., The Truth of Christianity. Cr. 8vo. 6s.

Tyll Owlglass' Marvellous and Rare Conceits. Translated by KENNETH MACKENZIE. Illustrated by ALFRED CROWQUILL. 3s. 6d. (*Lotos Series.*)

TYNAN, KATHARINE, Ballads and Lyrics. Sm. cr. 8vo. 5s.

A Nun: her Friends and her Order. Being a Sketch of the Life of Mother Mary Xaveria Fallon. Second Edition. Cr. 8vo. 5s.

TYNDALL, J., Forms of Water: in Clouds and Rivers, Ice and Glaciers. With 25 Illustrations. Tenth Edition. Cr. 8vo. 5s. (*I.S.S.*)

TYRRELL, WALTER, Nervous Exhaustion: its Causes, Outcomes, and Treatment. Cr. 8vo. 3s.

UMLAUFT, Prof. F., The Alps. Translated by LOUISA BROUGH. With 110 Illustrations. 8vo. 25s.

Under King Constantine. Cr. 8vo. 6s.

VAN EYS, W., Outlines of Basque Grammar. Cr. 8vo. 3s. 6d.

VAN LAUN, H., Grammar of the French Language. Cr. 8vo. Accidence and Syntax, 4s.; Exercises, 3s. 6d.

VELASQUEZ, M. de la CADENA, Dictionary of the Spanish and English Languages. For the use of Young Learners and Travellers. Cr. 8vo. 6s.

Pronouncing Dictionary of the Spanish and English Languages. Royal 8vo. £1. 4s.

New Spanish Reader. Passages from the most approved Authors, with Vocabulary. Post 8vo. 6s.

Introduction to Spanish Conversation. 12mo. 2s. 6d.

- VELASQUEZ and SIMONNE**, *New Method of Learning the Spanish Language*. Adapted to Ollendorff's system. Revised and corrected by Senor VIVAR. Post 8vo. 6s. ; Key, 4s.
- VIEYRA'S** *Pocket Dictionary of the Portuguese and English Languages*. 2 vols. Post 8vo. 10s.
- VIGNOLI, TITO**, *Myth and Science: an Essay*. Third Edition. With Supplementary Note. Cr. 8vo. 5s. (*J.S.S.*)
- VINCENT, FRANK**, *Around and About South America*. Twenty Months of Quest and Query. With Maps, Plans, and 54 Illustrations. Medium 8vo. 21s.
- VINCENT, R. HARRY**, *The Elements of Hypnotism*. Cr. 8vo. 5s.
- VINCENT, W. L.**, *Recollections of Fred. Leslie*. With Illustrations. 2 vols. 8vo. 30s.
- VIRGIL**. *The Georgics of Virgil*. Translated into English Verse by J. RHOADES. Sm. cr. 8vo. Second Edition. 2s. 6d.
- VIZETELLY, HENRY**, *Glances Back through Seventy Years*. 2 vols. 8vo. 32s.
- VOGEL, HERMANN**, *Chemistry of Light and Photography*. With 100 Illustrations. Fifth Edition. Cr. 8vo. 5s. (*J.S.S.*)
- VOLCKXSON, E. W. von**, *Catechism of Elementary Modern Chemistry*. Sm. cr. 8vo. 3s.
- WAGNER, Richard** *Wagner's Prose Works*. Translated by W. ASHTON ELLIS.
Vol. I.: *The Art Work of the Future &c.* 8vo. 12s. 6d. net.
Vol. II.: *The Drama*. 8vo. 12s. 6d. net.
Vol. III.: *The Theatre*. 8vo. 12s. 6d. net.
- WAITE, A. E.**, *Lives of Alechemystical Philosophers*. 8vo. 10s. 6d.
Magical Writings of Thomas Vaughan. Sm. 4to. 10s. 6d.
Real History of the Rosieruelians. With Illustrations. Cr. 8vo. 7s. 6d.
Mysteries of Magic: a Digest of the Writings of Eliphas Lévi. With Illustrations. 8vo. 10s. 6d.
- The Occult Sciences*. Cr. 8vo. 6s.
- WAKE, C. S.**, *Serpent-Worship, and other Essays*. With a chapter on Totemism. 8vo. 10s. 6d.
Development of Marriage and Kinship. 8vo. 18s.
- WAKE, C. STANILAND**, *Memoirs of the International Congress of Anthropology*. Roy. 8vo. 25s.
- WALKER'S** *Chess Studies*. New Edition. With Preface by E. FREEBOROUGH. Large post 8vo. 7s. 6d.
- WALLACE, WILFRID**, *Life of St. Edmund of Canterbury from Original Sources*. With Five Illustrations and Map. 8vo. 15s.
- WALLER, BOLTON**, *The Microcosm and Macrocosm: an Essay in Philosophy*. Cr. 8vo. 2s.
- WALLIS, J. WHITE**, *Manual of Hygiene*. Cr. 8vo. 2s. 6d.
- WALPOLE, C. G.**, *Short History of Ireland*. With 5 Maps and Appendices. Third Edition. Cr. 8vo. 6s.
- WALSHE, W. H.**, *Dramatic Singing Physiologically Estimated*. Cr. 8vo. 3s. 6d.
- WALTERS, J. C.**, *Tennyson, Poet, Philosopher, and Idealist*. 8vo. 12s.
- WANKLYN, J. A.**, *Milk Analysis: a Practical Treatise on the Examination of Milk and its Derivatives, Cream, Butter, and Cheese*. Second Edition. Cr. 8vo. 5s.

WANKLYN, J. A., and COOPER, W. J., Bread Analysis : a Practical Treatise on the Examination of Flour and Bread. Cr. 8vo. 5s.

Air Analysis : a Practical Treatise. With Appendix on Illuminating Gas. Cr. 8vo. 5s.

WANKLYN, J. A., and CHAPMAN, E. T., Water Analysis : a Treatise on the Examination of Potable Water. Eighth Edition. Entirely re-written. Cr. 8vo. 5s.

WARD, BERNARD, History of St. Edmund's College, Old Hall (Ware). With Illustrations. 8vo. 10s. 6d.

WARD, H. MARSHALL. The Oak : a Popular Introduction to Forest Botany. Cr. 8vo. 2s. 6d. (*Modern Science Series.*)

WARD, W. G., Essays on the Philosophy of Theism. Edited, with an Introduction, by WILFRID WARD. 2 vols. 8vo. 21s.

WARNER, Prof. F., Physical Expression : its Modes and Principles. With 50 Illustrations. Second Edition. Cr. 8vo. 5s. (*L.S.S.*)

WARTER, J. W., An old Shropshire Oak. 4 vols. 8vo. 56s.

WATERHOUSE, Col. J., Preparation of Drawings for Photographie Reproduction. With Plates. Cr. 8vo. 5s.

WATSON, JOHN FORBES, Index to the Native and Scientific Names of Indian and other Eastern Economic Plants and Products. Imp. 8vo. £1. 11s. 6d.

WEBER, A., History of Indian Literature. From the German by J. MANN and T. ZACHARIAE. Third Edition. Post 8vo. 10s. 6d. (*Trübner's Oriental Series.*)

WEDDING'S Basic Bessemer Process. Translated from the German by W. B. PHILLIPS and ERNST PROCHASKA. Roy. 8vo. 18s.

WEDGWOOD, H., Dictionary of English Etymology. Fourth Edition. Revised and Enlarged. 8vo. £1. 1s.

Contested Etymology in the Dictionary of the Rev. W. W. Skeat. Cr. 8vo. 5s.

WEDGWOOD, JULIA, The Moral Ideal : an Historic Study. Second Edition. 8vo. 9s.

WEED, C. M., Insects and Insecticides. Illustrated. Cr. 8vo. 7s. 6d.

WEED, C. M., Fungi and Fungicides : a Practical Manual. Cr. 8vo. 5s.

Spraying Crops : Why, When, and How. Illustrated. Paper cr. 8vo. 1s. 6d.

WEISBACH, JULIUS, Theoretical Mechanics : a Manual of the Mechanics of Engineering. Designed as a Text-book for Technical Schools and for the Use of Engineers. From the German by E. B. COXE. With 902 Woodcuts. Second Edition. 8vo. 31s. 6d.

WELLER, E., Improved French Dictionary. Roy. 8vo. 7s. 6d.

WESTROPP, HODDER M., Primitive Symbolism as Illustrated in Phallic Worship ; or, The Reproductive Principle. With Introduction by Major-Gen. FORLONG. 8vo. 7s. 6d.

WHELDON, J. P., Angling Resorts near London : the Thames and the Lea. Cr. 8vo. paper covers, 1s. 6d.

WHEELER, J. TALBOYS, History of India from the Earliest Ages. 8vo. (Vol. I. out of print.) Vol. II., 21s. Vol. III., 18s. Vol. IV., Part I., 14s. Vol. IV., Part II., 12s.

* * Vol. III. is also published as an independent work under the title of 'History of India : Hindu, Buddhist, and Brahmanical.'

Early Records of British India : a History of the English Settlements in India, as told in the Government Records and other Contemporary Documents. Roy. 8vo. 15s.

- WHERRY, E. M., Comprehensive Commentary to the Quran.** With SALE'S Preliminary Discourse, Translation and Additional Notes. Post 8vo. (Vols. I. II. and III. 12s. 6d. each. Vol. IV. 10s. 6d. (*Trübner's Oriental Series.*)
- WHIBLEY, CHAS., In Cap and Gown :** Three Centuries of Cambridge Wit. Second Edition. Cr. 8vo. 7s. 6d.
- WHINFIELD, E. H., The Quatrains of Omar Khayyám.** The Persian Text, with an English Verse Translation. Post 8vo. 10s. 6d. ; Translation only, 5s. (*Trübner's Oriental Series.*)
- Masnavi I Ma'navi :** the Spiritual Couplets of Maulána Jalálu-'d-Din Muhammad I Rúmí. Translated and Abridged. Post 8vo. 7s. 6d. (*Trübner's Oriental Series.*)
- WHITNEY, Prof. W. D., Life and Growth of Language.** Sixth Edition. Cr. 8vo. 5s. (*I.S.S.*)
- Essentials of English Grammar.** Second Edition. Cr. 8vo. 3s. 6d.
- Language and the Study of Language.** Fourth Edition. Cr. 8vo. 10s. 6d.
- Language and its Study.** With especial Reference to the Indo-European Family of Languages. Edited by R. MORRIS. Second Edition. Cr. 8vo. 5s.
- Sanskrit Grammar.** Including both the Classical Language and the older Dialects of Veda and Brahmana. Second Edition. 8vo. 12s.
- WHITWORTH, G. C., Anglo-Indian Dictionary :** a Glossary of Indian Terms used in English, and of such English or other non-Indian Terms as have obtained Special Meanings in India. 8vo. cloth, 12s.
- WICKSON, E. J., California Fruits, and How to Grow Them.** 8vo. 18s.
- WIECHMANN, FERDINAND G., Sugar Analysis.** For Refineries, Sugar-Houses, Experimental Stations, &c. 8vo. 10s. 6d.
- WILBERFORCE, Life of Bishop Wilberforce of Oxford and Winchester.** By HIS SON. Cr. 8vo. 6s.
- WILLARD, X. A., Practical Dairy Husbandry.** Complete Treatise on Dairy Farms and Farming. Illustrated. 8vo. 15s.
- Practical Butter Book.** Complete Treatise on Butter Making, &c. 12mo. 5s.
- WILLIAMS, S. WELLS, Syllable Dictionary of the Chinese Language :** arranged according to the Wu-Fang Yuen Yin, with the Pronunciation of the Characters as heard in Peking, Canton, Amoy, and Shanghai. Third Edition. 4to. £3. 15s.
- WILLIS, R., Life, Correspondence, and Ethics of Benedict de Spinoza.** 8vo. 21s.
- WILSON (Archdeacon), Rochdale Sermons, 1891-4.** Cr. 8vo. 5s.
- WILSON, H. H., Rig-Veda-Sanhita :** a Collection of Ancient Hindu Hymns. From the Sanskrit. Edited by E. B. COWELL and W. F. WEBSTER. 6 vols. 8vo. (Vols. I. V. VI. 21s. each ; Vol. IV. 14s. ; Vols. II. and III. in sets only.)
- The Megha-Duta (Cloud Messenger).** Translated from the Sanskrit of KALIDASA. New Edition. 4to. 10s. 6d.
- Essays and Lectures,** chiefly on the Religion of the Hindus. Collected and Edited by Dr. REINHOLD ROST. 2 vols. 21s.
- Essays, Analytical, Critical, and Philological,** on Subjects connected with Sanskrit Literature. Collected and Edited by Dr. REINHOLD ROST. 3 vols. 36s.
- Vishnu Purána :** a System of Hindu Mythology and Tradition. From the Original Sanskrit. Illustrated by Notes derived chiefly from other Puráns. Edited by FITZEDWARD HALL. 6 vols. (including Index), £3. 4s. 6d.
- Select Specimens of the Theatre of the Hindus.** From the Original Sanskrit. Third Edition. 2 vols. 21s.

- WILSON, H. SCHUTZ**, *'Tis Sixty Years Since*; or, *The Two Locksley Halls*. Cr. 8vo. 1s. 6d.
- WILSON, Mrs. R. F.**, *The Christian Brothers: their Origin and Work*. With Sketch of Life of their Founder. Cr. 8vo. 6s.
- WITHERBY, HARRY**, *Forest Birds, their Haunts and Habits*, with illustrations. Cr. 8vo. 2s. 6d.
- Within Sound of the Sea**. With Frontispiece. Cr. 8vo. 6s.
- WOLSELEY, WILLIAM** (Admiral of the Red Squadron), *Memoir of*, by MARY C. INNES. 8vo. 9s. net.
- WOLTMANN, ALFRED**, and **WOERMANN, KARL**, *History of Painting*. With numerous Illustrations. Med. 8vo. Vol. I. *Painting in Antiquity and the Middle Ages*, 28s. Vol. II. *The Painting of the Renaissance*, 42s. The two volumes may be had bound in cloth with bevelled boards and gilt leaves, price 30s. and 45s. respectively.
- WOOD, A. T.**, *Compound Locomotives*. Revised and Enlarged by D. L. BARNES. 8vo. 12s. 6d.
- WOOD, M. W.**, *Dictionary of Volapük: Volapük-English and English-Volapük*. Cr. 8vo. 10s. 6d.
- WOODBURY, CHAS. J.**, *Talks with Ralph Waldo Emerson*. Cr. 8vo. 5s.
- WOOLDRIDGE, L. C.**, *On the Chemistry of the Blood, and other Scientific Papers*. Arranged by VICTOR HORSLEY and ERNEST STARLING. With Introduction by VICTOR HORSLEY. With Illustrations. 8vo. 16s.
- WORDSWORTH Birthday Book**. Edited by ADELAIDE and VIOLET WORDSWORTH. 32mo. 2s.; cloth limp, 1s. 6d.
- WORDSWORTH, Selections from**. By WILLIAM KNIGHT and other Members of the Wordsworth Society. Printed on hand-made paper. Large cr. 8vo. With Portrait. Vellum, 15s.; parchment, 12s. Cheap Edition, cr. 8vo. 4s. 6d.
- WORDSWORTH, E.**, *Henry William Burrows*. Memorials, with Portrait. Cr. 8vo. 6s.
- WORSAAE, CHAMBERLAIN J. J. A.**, *The Pre-history of the North*. Based on contemporary Memorials. Translated by H. F. MORLAND SIMPSON. Cr. 8vo. 6s.
- WORTHAM, B. HALE**, *Satakas of Bhartrihari*. Translated from the Sanskrit. Post 8vo. 5s. (*Trübner's Oriental Series*.)
- WORTHY, CHARLES**, *Practical Heraldry: an Epitome of English Armoary*. With 124 Illustrations. Cr. 8vo. 7s. 6d.
- WRIGHT, G. FREDERICK**, *The Ice Age in North America, and its Bearing upon the Antiquity of Man*. With Maps and Illustrations. 8vo. 21s.
- Man and the Glacial Period**. With 111 Illustrations and Map. Cr. 8vo. 5s. (*J.S.S.*)
- WRIGHT, THOMAS**, *The Celt, the Roman, and the Saxon: a History of the Early Inhabitants of Britain down to the Conversion of the Anglo-Saxons to Christianity*. Fifth Edition, corrected and enlarged. With nearly 300 Engravings. Cr. 8vo. 9s.
- WRIGHT, W.**, *The Book of Kalilah and Dimnah*. Translated from Arabic into Syriac, with Preface and Glossary in English. 8vo. 21s.
- WURTZ, Prof.**, *The Atomic Theory*. Translated by E. CLEMINSHAW. Fifth Edition. Cr. 8vo. 5s. (*J.S.S.*)

WYLDE, W. *The Inspection of Meat: a Guide and Instruction Book to Officers supervising Contract Meat, and to all Sanitary Inspectors.* With 32 Coloured Plates. 8vo. 10s. 6d.

YOUNG, Prof. C. A., *The Sun.* With Illustrations. Third Edition. Cr. 8vo. 5s. (I.S.S.)

YOUNG, ROSALIND AMELIA, *Mutiny of the 'Bounty,' and Story of Pitcairn Island: 1790-1894.* By a NATIVE DAUGHTER. Third Edition, illustrated. Cr. 8vo. 5s.

YOUNG, ELIZA A., *First Book of Botany.* Designed to Cultivate the Observing Powers of Children. With 300 Engravings. New and Cheaper Edition. Cr. 8vo. 2s. 6d.

POPULAR SCIENCE MONTHLY.

~~~~~  
Edited by Professor **WILLIAM JAY YOUNG.**  
~~~~~

ESTABLISHED OVER TWENTY YEARS.

THE ONLY MAGAZINE OF ITS CLASS.

Records all Scientific Facts and Discoveries.

Is a Register of all Scientific Developments.

*Is so Written as to be Interesting and Instructive to the
General Public.*

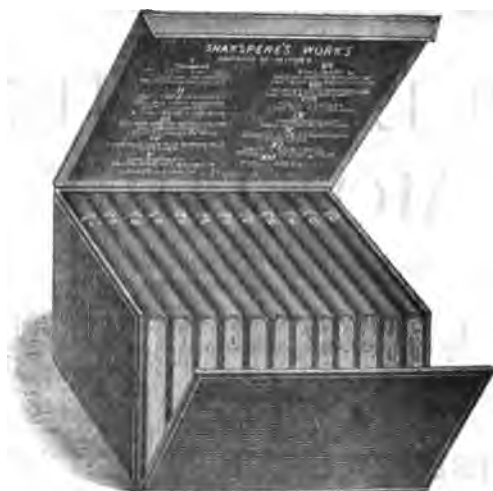
PRICE 2s. 6d. NET; ANNUAL SUBSCRIPTION, 30s. NET.

SHAKSPERE'S WORKS.

THE AVON EDITION,

Printed on thin opaque paper, and forming 12 handy volumes, cloth, 18s., or bound in 6 volumes, 15s.

The set of 12 volumes may also be had in a cloth box (*see Illustration*), price 21s., or bound in roan, persian, crushed persian levant, calf, or morocco, and enclosed in an attractive leather box, at prices from 31s. 6d. upwards.



THE PARCHMENT LIBRARY EDITION,

In 12 volumes elzevir 8vo., choicely printed on hand-made paper, and bound in parchment or cloth, price £3. 12s., or in vellum, price £4. 10s.

The set of 12 volumes may also be had in a strong cloth box, price £3. 17s., or with an oak hanging shelf (*see Illustration*), £3. 18s.



THE AMERICAN PATENT REVOLVING BOOKCASE.

The Revolving Bookcase will be found a great convenience by those who wish to have from 80 to 200 volumes accessible while seated at a table or by the fireside. This bookcase occupies no more space than an ordinary whatnot, and can be wheeled from one part of a room to another. It is particularly suitable for Private Libraries, for Studies, and for the Consulting Chambers of Barristers, Physicians, &c.



Size No. 1, 36 inches high.

PRICE FROM 4 GUINEAS.

These Bookcases are made in various sizes, 24 inches square, 36 to 59 inches high, with eight, twelve, or sixteen shelves, in ash, walnut, mahogany, oak, and ebonised, and neatly finished so as to form handsome pieces of furniture. A special form of Revolving Bookcase has been designed to hold the set of 'Encyclopædia Britannica.'

Specimens of the different sizes and woods can be seen in use at

PATERNOSTER HOUSE,
CHARING CROSS ROAD, LONDON.
KEGAN PAUL, TRENCH, TRÜBNER, & CO. Ltd.,
SOLE AUTHORISED AGENTS.

Illustrated Price List on receipt of one Stamp.

PERIODICALS

Published and Sold by KEGAN PAUL, TRENCH, TRÜBNER, & CO.

- American Journal of Science.** Monthly. Annual Subscription, £1. 10s.
- American Machinist.** Weekly. Annual Subscription, 16s. 6d.
- Anthropological Institute of Great Britain and Ireland, Journal of.** Quarterly. 5s.
- Asiatic Society of Bengal, Journal of.** 8vo. 3s. *per number*. Proceedings, 1s. *per number*.
- Asiatic Society, Royal.** Bombay Branch. Journal—Irregular.
- Asiatic Society, Royal.** Ceylon Branch. Journal—Irregular.
- Asiatic Society, Royal.** China Branch. Journal—Irregular.
- Asiatic Society, Royal.** Straits Branch. Journal—Irregular.
- Bibliotheca Sacra.** Quarterly. Annual Subscription, 14s.
- British Chess Magazine.** Monthly, 9d.
- Calcutta Review.** Quarterly, 6s.
- Indian Antiquary.** A Journal of Oriental Research in Archæology, History, Literature, Languages, Philosophy, Religion, Folklore, &c. Annual Subscription, £1. 16s.
- Indian Evangelical Review.** „ 10s.
- Meister, The.** Journal of the Wagner Society. Irregular. 6s.
- Philological Society, Transactions and Proceedings of.** Irregular.
- Popular Science.** Monthly, 2s. 6d. net. Annual Subscription, 30s.
- Psychical Research Society, Proceedings.** Irregular.
- Sanitarian.** Devoted to the Preservation of Health, Mental and Physical Culture. Monthly. Annual Subscription, 18s.
- Science.** Weekly. „ £1. 5s.
- Scientific American.** Weekly. „ 18s.
- **Export Edition.** Monthly. „ £1. 5s.
- **Building Edition.** Monthly. „ 14s.
- Supplement.** Weekly. „ £1. 5s.
- Tropical Agriculturist.** Monthly. „ £1. 6s.
- Parents' Review.** Monthly. 6d.

Messrs. KEGAN PAUL, TRENCH, TRÜBNER & CO. Ltd. are also Publishers to the following Societies, &c., lists of publications of which may be had on application.

The Chaucer Society.
The Early English Text Society.
The Egypt Exploration Fund.
The New Shakspeare Society.

The British Museum.
The Geological Survey of India.
The India Office.

018



555018a



89094555018



B89094555018A